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ABSTRACT

Volume 1 of a two volume series deals with special education program costs in British Columbia with a focus on programs for mentally retarded children. After an introduction, seven categories of handicapping conditions are defined and the applicability of the proposed program categories to educational needs is discussed. The section on special education program costs describes the cost index and the National Educational Finance Project which developed the Rossmiller cost indices. The section also explores differences between elementary and secondary special education programs and among different delivery systems, and examines estimation of cost indices of programs for low trainable mentally handicapped students. The applicability of the cost indices and the function of pupil/teacher ratios in the context of costs are also surveyed. The applicability of incidence rates of handicapping conditions to the cost index is evaluated in a separate section. The required level of finance for the funding of special education programs for mentally handicapped children in British Columbia is presented in the fifth section. Cost effectiveness in relation to educational goals, special education programs, and the school district is considered in the sixth section. The final section presents recommendations that the special education program categories and cost indices be adopted and that ongoing research be initiated. Volume 2 provides extensive appendices, including financial guidelines and reviews of other programs. (PHR)

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EDUCATIONAL PROGRAM COSTS FOR MENTALLY RETARDED CHILDREN IN PUBLIC SCHOOLS

R.J. LeBrasseur, M.A.
January, 1979.

VOLUME 1

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ABSTRACT

Public school programs for school-age (5-18) handicapped children were defined with an attempt to do so according to educational needs rather than handicap per se. The costs of these programs were described with the cost index as the main statistic, where the index was defined as the ratio of the cost of a special program over the cost of the regular program. Cost indices of elementary and secondary programs, and program delivery systems were discussed. The index of programs for low trainable mentally retarded pupils was estimated. Pupil-teacher ratios also were discussed. A best estimate of incidence rates of handicapped conditions was calculated. The method of determining level of required finance for programs for mentally retarded children was explained, and was applicable to other special education programs. Cost-effectiveness was explored at the levels of educational goals, special education programs, and the school district. Finally, recommendations were presented. Throughout this work, the applicability and limitations of the conclusions were elaborated. The need for on-going research in special education for planning purposes was strongly argued.

FORWARD

This report is presented in two volumes. Volume 1 deals with special education programs costs and related matters with a focus on programs for mentally retarded children. Volume 2 contains the detailed documentation on which Volume 1 is based; publications are summarized and commented on, and relevant extracts are presented.

Volume 2 is organized as a series of appendices with a coding system of double letters identifying the particular appendix and the tables and figures with it (e.g., Appendix RD, Table RD1, Figure RD 2). When reference is made in Volume 1 to material contained in Volume 2, the particular appendix is identified. Similarly, a table or figure taken from an appendix has its appendix code number given (e.g., Table 2 (RD 3)). The table of contents of both volumes are given in Volume 1 to fully identify references to appendices, and to inform the reader of the contents of Volume 2.

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Behind every writer and his report, stands a group of dedicated helpers. I would like to thank the staff of W/C Project for their frequent assistance which was relatively unhampered by three thousand miles of distance. Many thanks to Dr. P. Woodward, Project Coordinator, whose administrative flexibility made possible the contracting of my services. Lastly, special thanks to my sister Rita, who worked many evenings and weekends typing the report, and whose experience made possible its quality format. My hope is that when they see the report, they experience a goodly measure of satisfaction.

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1.0 INTRODUCTION

Woodlands/Community Education Services Project was established in 1976 for the purpose of obtaining community educational services for retarded persons residing at Woodlands (Institution)[1]. On a fee-for-services basis, the Project has contracted an ever increasing amount of services from local school districts. Many of the residents have been integrated into community schools, while others attend new classes within the institution staffed by school district personnel.

The Project has also expanded its interests to include the development of a comprehensive curriculum for retarded persons based on an individual program planning approach, and educational planning of a broader scope. From the beginning, considerable effort was expended in cost accounting the various project educational programs. The goal was to develop cost guidelines for the education of retarded persons with different handicaps and different educational needs. These local cost guidelines hopefully would aid the Ministries of Human Resources and Education in long-term planning of community educational services for retarded persons, in particular the multiply handicapped for whom little educational cost information is available.

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[1] Woodward, P. and LeBrasseur R.J. Woodlands/Community Educational Services Project, Year I: September 1976 - June 1977, Vol. 1 and 2. Prepared for Woodlands of Ministry of Human Resources and School Districts Nos. 43 (Coquitlam), 36 (Surrey), and 40 (New Westminster), September 1977.

As a complement to the cost accounting of Project programs, a literature survey of educational costs was contracted and is here presented. In the United States, the last decade has witnessed a dramatic increase of community educational services for exceptional children, prompted in large measure by legislation mandating a public education for each child in the least restrictive setting (e.g., Public Law (P.L.) 94-142. It was reasonable to assume that sufficient time had elapsed so that a wealth of cost and cost-related information was available in digested form.

In addition to solicitation of known sources of information, a computer assisted (ERIC) search was performed and promising works were obtained. The less relevant publications were deleted, and a total of twenty (20) works and twelve (12) abstracts were reviewed. This data base may be found in Volume 2 as a series of appendices.

Researching the costs of educating retarded persons of school age turned out to be a hazardous undertaking. It was discovered that the number of interwined variables were many and confused: special vs regular education; kind and severity of handicapping conditions; program delivery alternatives; numerous methods of cost accounting; economy of scale affecting program costs; effects of funding formulas and level of funding on programs offered; past vs future orientation in planning, and others. Confronted with this mass of data, it was decided that the minimum required was the orderly and understandable presentation of costs and important cost-related facts and conclusions; in the process, sufficient light likely would be shed on the costs of educating retarded children in particular.

With the aid of two existing comprehensive reports (Bernstein, Kirst, Hartman and Marshall, 1976, reviewed in Appendix BC; Marinelli, 1976, reviewed in Appendix MA) the scenario of educational financing was overviewed. The conclusion that program costs are interrelated with a number of other variables is clearly indicated and no sound understanding of costs is possible without referring to the entire educational system within which they result.

The conclusion led to the following plan of action. Firstly, in the context of the time and funds allotted to the literature survey, an in-depth study of the educational finance matrix was not possible. Alternatively, data could be screened and collected for this purpose, hence the detailed appendices presented as Volume 2 of this report. The appendices also acted as data base for Volume 1.

Secondly, planning of adequate finance for special education programs was possible if incidence rates of handicapping conditions and program cost by pupil handicapping condition were available. A basic planning package was elaborated with emphasis on programs for mentally retarded children. Finally no presentation of costs is complete without a cost-effectiveness analysis. A systems approach to educational finance was elaborated and the obstacles to optimal cost-effectiveness were discussed.

Both the basic planning guide and the cost-effectiveness discussion may be found in Volume 1 along with conclusions and recommendations. Section 5 on the planning package and Section 7 on recommendations are essential readings, with the other sections supporting their content.

2.0 EDUCATIONAL PROGRAM CATEGORIES FOR HANDICAPPED PERSONS

Ideally programs would be categorized by the educational needs of the students within them. However, the general practice is a mixture of using the students' gross physical characteristics or symptoms (e.g., Blind, Physically Handicapped), typical behaviors (e.g., Emotionally disturbed) results of psychological testing (e.g., Mentally Retarded), and difficulties in learning (e.g., Special Learning Disorders). A rational classification system based on educational needs, and not handicaps per se, is far overdue. However, such an accomplishment would not aid a cost literature survey where the bulk of publications use traditional program categories.

A compromise approach was adopted using typical program categories with some modifications based on well-supported evidence. These categories were taken primarily from the NEFP Rossmiller study (Appendix RD) because of the prime importance of this publication, and the compatibility of its categories with those employed by the U.S. Office of Education. The seven (7) categories of programs for the handicapped were defined as follows:

A) Intellectually Handicapped - special programs designed specifically for students identified as being mentally retarded and unable, without special help, to benefit from the regular school program.

  A1) Educable Mentally Retarded. (i.e., mildly retarded).

  A2) High Trainable Mentally Retarded. (i.e., moderately retarded).

A3) Low Trainable Mentally Retarded (i.e., severely and profoundly retarded).

B) Auditorily Handicapped - special programs designed specifically for students identified as being hard-of-hearing or deaf.

B1) Mildly Auditorily Handicapped (i.e., hard-of-hearing).

B2) Severely Auditorily Handicapped (i.e., deaf or almost deaf).

C) Visually Handicapped - special programs designed specifically for students identified as being blind or partially sighted.

C1) Mildly Visually Handicapped (i.e., partially sighted).

C2) Severely Visually Handicapped (i.e., Blind or almost blind).

D) Physically Handicapped - special programs designed specifically for students identified as having physical disabilities resulting from congenital defects, disease or accident (Students in special programs because of cardiac conditions, diabetes, allergies, etc. were included here).

E) Speech Handicapped - special programs designed specifically for students identified as having speech defects (Language disorders, i.e. problems in the acquisition and use of a language system, were reported in the category Special Learning Disorders).

F) Special Learning Disorders - special programs designed specifically for students who exhibit a severe disorder in one or more of the processes involved in understanding or using spoken or written language, such as aphasia, and for students identified as having disabilities which arise from brain injuries or inadequate development of the central nervous system including cerebral palsy, epilepsy, encephalitis, and minimal brain injury.

G) Emotionally disturbed - special programs designed specifically for students who exhibit severe and frequent maladaptive behavior which seriously reduces their attention and learning.

In the program category Intellectually Handicapped, a distinction was made between High Trainable and Low Trainable Mentally Retarded with the latter including persons typically excluded from all public schools until recently, namely the multiply handicapped severely and profoundly retarded.

Special Learning Disorders included persons usually enrolled in programs for those with neurological and/or mental disorders. This grouping was justified in that the programs were non-distinguishable at the service level (Appendix RD).

Multiple Handicapped was excluded entirely because programming was typically dictated by the most significant handicap defined as the biggest immediate impediment to learning (i.e., Blind). This category will reemerge in combination with the seven categories in the section on program costs. Intellectually gifted was excluded because it was deemed unrelated to mental retardation. Similarly, the "compensatory" programs for socially, economically, and/or cultural dis-advantaged children did not fall within the scope of this study.

The seven program categories also may be entirely listed under elementary and secondary programs, with occupational programs added to the latter. The dimensions of severity of handicap can be added to all categories, but these distinctions would be qualitative, arbitrary and variable.

2.1 Applicability of Proposed Program Categories

A totally rational typology of exceptional programs is not possible in the immediate future for a number of reasons. Firstly, the educational needs of the students are difficult to identify because of the lack of clearly defined educational goals. For example, no comprehensive prescriptive curriculum exists which would permit the full identification of the child's education program needs and program content. A growing number of attempts at producing such a curriculum have taken place recently, especially in the field of mental retardation. Secondly, given the low level of integration of the sciences related to education, and the independent nature of school districts and teachers, a comprehensive curriculum and other attempts at standardization would have little chance of wide acceptance. Thirdly, some handicapping conditions have significant stigma attached to them, and grouping of students according to program need would be opposed by both school staff and the general population. For example, though programs for educable mentally retarded students are very similar to programs for students with special learning disorders (Appendix RD), these two groups of students are separated. In fact, one criterion for placement in the program for special learning disorders is the absence of mental retardation. This segregation very well may be related to the common historical role perception of mentally retarded persons as a menace to society and to normal persons.

The proposed program classification system presented in the previous section will meet with little resistance because it is composed mostly of traditional categories. In addition, some small steps were taken to align the categories with educational needs. For example, programs for children with neurological disorders such as Brain Injured or Minimal Brain Injured, were grouped under Special Learning Disorders because of similarity of program content.

Programs for intellectually handicapped pupils were labelled with no reference to intelligence tests; for example, programs for severely and profoundly retarded persons were called Low Trainable Mentally Retarded. IQ tests and social adaptiveness measures are widely used to place retarded persons in particular programs even though the tests themselves offer little assistance in program planning and are poor indicators of performance in school. Reynolds pointed out these misuses back in 1963 (Appendix RA) and Rossmiller documented their wide practice during 1968-69 (Appendix RD). The present survey has confirmed the continued utilization of IQ tests for program placement. However, there also exist indications of a trend toward program placement by educational needs for all handicapped pupils.

In the 1970's large numbers of severely handicapped children have enrolled in the public schools of the United States and each one of them legally requires an individual program plan. These pressing demands have created the need for efficient evaluation of educational needs and educational programming for a wide variety of handicapped conditions. Partially in response to this efficiency problem, numerous prescriptive curricula for specific skill areas have appeared on the market along with a few attempts at a comprehensive curriculum. Mentally retarded pupils likely will benefit from this new orientation to individual program plans and prescriptive curricula.

The proposed program categories may be useful as an interim measure. Serious consideration should be given to the research and development of a coherent educational needs profile and accompanying program classification system.

3.0 SPECIAL EDUCATION PROGRAM COSTS

3.1 Introduction to the Cost Index

Volume 2 of this study has documented amply the extreme variability of educational program costs across school districts for both regular and special programs. In the absence of a sophisticated statistical analysis coupled with on-going research, a macro approach to cost estimation was considered defensible (i.e., feasible) and useful for planning purposes.

The per pupil cost index as a unitary measure of special education cost has been widely adopted for cost research purposes since 1970 when Rossmiller and his associates introduced the concept (Appendix RD). The index is defined as the ratio of the per pupil cost of a special program over the per pupil cost of a regular program with both costs from the same school district or districts. This cost statistic has the advantage of attempting to control for local variations in costs, by the ratio approach, and of imposing a standardized accounting method (see Figure 1)

For example, a program for educable mentally retarded pupils which costs $800 per pupil in one school district appears less expensive than another similar program in another school district which costs $1,000 per pupil. Some of this difference may be due to the inclusion of different expenditure items. Assuming that accounting practices are identical or very similar, comparison of these program costs to their respective regular program costs would give us a better appreciation of the additional costs of the

Figure 1 (MA1): Components of Special and Regular Education Costs: Rossmiller Method

	Regular program cost (1)	Regular program cost per pupil [a] (2)	Special program cost by category of exceptionality (3)	Special program cost per pupil by category of exceptionality [b] (4)	Cost differential per pupil or excess cost [c] (5)	Cost index of special to regular program [d] (6)
Management Administration						
Clerical and secretarial						
Instruction Teachers						
Teacher aides						
Instructional Support Supplies and equipment						
Guidance and counseling						
Other						
Institutional Operations Operating and maintenance						
Fringe benefits						
Other						
Services Health						
Food						
Transportation Cost per pupil in ADM						
TOTAL Current operation [e]						
Transportation Cost per pupil transported						
Capital outlay/ ADM						
Debt service/ ADM						
Teacher-pupil ratio						
Square feet of classroom space per pupil						

Note. From *Educational Programs for Exceptional Children: Resource Configurations and Costs* (National Educational Finance Project Study No. 2), by R. A. Rossmiller, J. A. Hale, and L. Frohreich, Madison: Department of Educational Administration, University of Wisconsin, 1970, p. 256.

[a] Costs of regular education divided by FTE (full time equivalency) of pupils in regular education. (FTE = 1.0 = Students assigned to program full time.)

[b] Costs of special education divided by FTE of pupils in special education.

[c] Column 4 minus column 2.

[d] Column 4 divided by column 2.

[e] The cost index reported for a special program was based on Total Current Operation (Present Author).

special program. If the $800 EMR program is compared to a regular program in the same district which costs $400 per pupil, the ratio of the two equals 2.0 ($800/$400). Similarly the $1000 EMR program is compared to its respective regular program costing $750 per pupil and resulting in a cost ratio of 1.33 ($1000/$750). Comparison of the cost ratios suggests the opposite conclusion based on program costs only. Since both the special and regular programs from the same school district are subject to the same economic and administrative factors, the ratio of the two, entitled the cost index, is the better measure of the actual cost of a special program.

In a later section, possible distortions of the cost index will be discussed. Nevertheless, the per pupil cost index remains the best macro statistic presently available.

3.2 National Educational Finance Project (NEFP) and Rossmiler Cost Indices

The American national study conducted by Rossmiller, Hale and Frohreich has set the standard of quality for special education cost research. No study since has equalled its scope and thorough methodology. Based on the 1968-69 school year, this work sampled 24 school districts in five states (Wisconsin, Florida, California, Texas and New York) noted for their "current best practice" in special education. Therefore the cost indices reported may be used for modelling purposes.

Table 2 presents a summary of their cost findings with a full-time equivalent (FTE) pupil as the standard measure. The cost indices ranged from 1.18 for Speech Handicapped to 3.64 for Physically Handicapped. Salaries of instructional staff were identified as the single most important contributor to the cost index[2]. In particular, the teacher-pupil ratio affected both the instructional cost per pupil and the operation and maintenance cost per pupil (i.e., fewer pupils per classroom). A summary of pupil-teacher ratios may be found in Table 15 (p.42). A considerable range of pupil-teacher ratios was present for all programs which may reflect a number of factors including severity of handicap, system of program delivery, availability of pupils and district policy. The mean pupil-teacher ratios were given to facilitate comparisons.

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[2] The present author has estimated that 31% to 70% of the total operational costs were for salaries of teachers and teachers' aides, with an average cost of 52%.

TABLE 2 (RD 28): Regular and Exceptional Program Costs and Cost Indices as Reported by Rossmiller, 1968-69

Program Category	Exceptional Program Cost[a] (A)	Regular Program Cost[a] (B)	Cost Index (A/B)
Educable Mentally Retarded	$1,316	$655	1.87
Trainable Mentally Retarded	$1,627	$655	2.10
Auditorily Handicapped	$2,103	$655	2.99
Visually Handicapped	$2,197	$655	2.97
Physically Handicapped	$2,113	$653	3.64
Speech Handicapped	$ 799	$653	1.18
Special Learning Disorders	$1,757	$673	2.16
Emotionally Disturbed	$1,683	$655	2.83
Multiple Handicapped	$1,941	$734	2.73[b]

[a] Median value among sample of school districts.

[b] Small sample size of N = 4

N.B. Cost per full-time equivalent pupil.

Utilisation of some teachers' aides was present for all programs including the Regular program. Low utilisation was evident for Educably Mentally Retarded and Speech programs . Physically Handicapped programs made extensive use of aides with no discernable relation to teacher-pupil ratio. In contrast, programs for Auditorily Handicapped and Special Learning Disorders made extensive use of aides when pupil-teacher ratios were low; it was concluded that two groups of pupils of differing intensity of handicap were being served in each of these programs.

Transportation costs were noted as particularly high for some handicapping conditions. Since no tabular summary was presented, the present author estimated the transportation cost indices using only cost data that appeared to be based on actual values. For example, school districts reporting identical costs for regular and special programs were excluded on the grounds that this figure was only the average cost. The low cost reported by some districts probably indicated that districts did not offer special transportation for its handicapped pupils. Similarly districts reporting identical cost for all handicapped conditions were excluded because the figures given were the average cost and did not reflect actual costs by handicapped condition. With a small sample of six (6) school districts, transportation cost indices were estimated and may be found in Table 3. They ranged from 1.0 for Speech Handicapped (i.e., regular transportation cost) to 20.0 for Physically Handicapped, or 20 times as costly as the per pupil regular transportation cost. The range of indices among school districts was considerable for all handicapped conditions. Therefore, the mean cost indices should be treated as rough approximations.

TABLE 3 (RD 33): Transportation Cost Indices of Special Education Programs Based on Data Reported by Rossmiller, 1968-69

HANDICAPPED CONDITION	MEAN COST INDEX
Educable Mentally Retarded	6.1
Trainable Mentally Retarded	11.7
Auditorily Handicapped	15.2
Visually Handicapped	18.5
Physically Handicapped	20.0
Speech Handicapped	1.0
Special Learning Disorders	11.4[a]
Emotionally Disturbed	5.5

[a] Based on data from 3 school districts.

N.B. These cost indices were obtained through averaging the indices of 4 to 6 school districts which gave evidence of discriminating transportation costs across handicapped conditions. The cost indices above should be treated as rough approximations.

Most of the other expenditure categories were significantly related to the cost differential. Frohreich (Appendix FB) summarized the findings of the study which are presented in Table 4. Similarly Bentley (Appendix BA) analysed the data of the Rossmiller study and found that only expenditures for clerical and food services did not contribute significantly to the cost differentials between special educational programs and regular programs. All of the other expenditure components were found to contribute significantly to the cost differential. However, the degree to which the various expenditure components contributed to the cost differentials varied considerably from district to district and from program to program.

TABLE 4 (FB 2): Expenditure Categories that Contributed the Most to Cost Differentials Between Exceptional and Regular Programs: Rossmiller, 1968-69

Category of exceptionality	*Expenditure categories*							
	Administration	*Teachers*	*Supplies and equipment*	*Guidance and counseling*	*Other Instructional support*[2]	*Operation and maintenance*	*Fringe benefits*	*Transportation*
Intellectually gifted	X[1]	...	...	...	...	...	...	...
Educable mentally retarded		...	...	...	...	...	...	...
Trainable mentally retarded	X	X	...	...	X	X	...	X
Auditorily handicapped	X	...	X	...	...	X	X	X
Visually handicapped	X	X	X	...	X	X	X	X
Physically handicapped	X	X	X	...	...	X	...	X
Speech handicapped	X	X	X	X	X	X	...	X
Special learning disorders	...	...	...	...	X	...	...	...
Emotionally disturbed	X	X	X	X	X	X	...	X
Multiply handicapped	X	X	X	...	X	X	X	X
	X	X	...	...	X	X	X	X

[1] An X designates a cost differential of more than 1.25 times between the expenditure category cost per pupil associated with an exceptional program and the expenditure category cost per pupil associated with the regular program in a majority of the programs studied.

[2] Including specialized personnel.

Other studies have been conducted, most of which have used the NEFP methodology with simplifications. Their findings are presented in Table 5 and tended to support the relative cost findings of the NEFP study. However, considerable variation of cost indices within each program category was evident. The findings of these studies were not preferred over the Rossmiller indices because they were based on fewer school districts of which only some were noted for their quality programs.

3.3. Cost Indices of Elementary and Secondary Special Education Programs

The NEFP Rossmiller study failed to discriminate between elementary and secondary programs and between the various program delivery systems. Subsequent state studies addressed these areas but yielded limited results. Usually all school districts within a state were included, thus ignoring the criterion of "best current practice". Methodology was altered to suit the particular interests of that state (e.g., excluding transportation costs) making comparisons among these state studies and with the NEFP study very difficult. Rossmiller and Moran (Appendix RC) pointed out that several of the state studies related elementary special education program costs to elementary regular program cost and secondary special program cost to secondary regular program cost. Other states related special program costs regardless of level to the regular program cost. Furthermore, the educational levels were generally not comparable.

TABLE 5 (MA 5): Summary of Studies Reporting Special Education Cost Indices

	Study and States Involved						
Category of Exceptionality	Rossmiller et al.[a] (Wis., Fla., Calif., Texas, and N.Y.)	Jones and Wilkerson[b] (Indiana)	Sorenson[c] (Illinois)	Snell[d] (Indiana)	Clemmons[e] (Minnesota)	Texas Education Agency[f] (Texas)	N.Y City Board of Education (N.Y. City)[g]
Gifted	1.14						
Educable mentally retarded	1.87	1.63	1.72	1.94	1.71	2.83	2.10
Trainable mentally retarded	2.10	1.79	2.31	1.81	2.03	2.22	2.67
Auditorily handicapped	2.99	3.71	2.35 (hard of hearing) 2.41 (deaf)	1.55	2.99	3.48	3.02
Visually handicapped	2.97	6.01	2.75	—	2.34	4.38	3.00
Speech handicapped	1.18	1.19	—	1.22	1.27	5.97	1.10
Physically handicapped	3.64	2.76	2.94	4.18	2.89	2.39	3.42
Special learning disorders	2.16	2.38	2.02	1.32	1.75	2.76	3.37
Emotionally disturbed	2.83	3.73	3.95	—	—	2.61	3.11
Multiply handicapped	2.73	2.93	3.38	—	—	—	5.18
Homebound/Hospitalized	1.42	1.74		1.56	1.22	—	
Pregnant students						1.29	
Minimally brain injured						2.94	

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[a] Rossmiller, R. A., Hale, A., & Frohreich, L. E. *Educational Programs for Exceptional Children: Resource Configurations and Costs* (National Educational Finance Project Study No. 2). Madison: University of Wisconsin, 1970.

[b] Jones, P. R., & Wilkerson, W. R. *Special Education Program Cost Analysis.* Bloomington: Department of School Administration, Indiana University, 1972.

[c] Sorenson, F. W. *A Cost Analysis of Selected Public School Special Education Systems in Illinois.* Springfield, IL.: Office of the Superintendent of Public Instruction, 1973.

[d] Snell, D. E. *Special Education Program Cost Analysis for Three Selected School Corporations in Indiana.* Unpublished doctoral dissertation, Indiana University, 1973.

[e] Clemmons, A. L. *An Assessment of Cost Variations in Selected Exemplary Special Education Programs in Six Selected Minnesota School Districts.* Unpublished doctoral dissertation, University of New Mexico, 1974.

[f] School Finance-Special Projects Section, Office of the Commissioner of Education, Texas Education Agency. *Educational Program Cost Differentials in Texas* (Prepared for the Governors Office of Educational Research and Planning). Austin: Texas Education Agency, 1975.

[g] N.Y City Board of education, 1977. See Appendix NB.

N.B. Except for column on N.Y. City, table taken from Marinelli (1976).

Another area of incomparability concerned the definitions of special educational programs and the exceptionality included. Keeping these differences in mind, Table 6 presents the cost indices reported in these state studies. Two additional state studies may be found in Table 7. In general, the cost indices of secondary special education programs were somewhat lower than the cost indices of their elementary counterparts.

3.4. Cost Indices of Program Delivery Systems

Reynolds (Appendix RB) outlined an organizational scheme for program delivery systems which has been widely quoted since. Both the type and severity of handicapping conditions were implicit in the hierarchical arrangement of the following nine program alternatives:

1. Regular classroom with consultation to the regular teacher.
2. Regular classroom supplemented by an itinerant teacher.
3. Regular classroom supplemented by a resource teacher.
4. Part time special class.
5. Full time special class.
6. Special day school.
7. Homebound instruction.
8. Residential school.
9. Hospital school.

TABLE 6 (RC 3): Cost Indices of Sepcial Education Elementary and Secondary Programs.

	A		B		NEFP*	C**				D***
Preschool Programs	—		1.05		—	—		—		—
Early Childhood	—		—		—	—		—		
Kindergarten	—		1.05		—	—		—		
Elementary Programs	1.71	(K-6)	1.70	(1-8)	—	2.21	(1-6)			
Gifted	—		1.68		1.15					
Educable Mentally Retarded	1.48		1.68		1.92					
Trainable Mentally Retarded	1.60		1.73		2.20					
Learning Disabilities	2.31		1.52		2.50					
Socially & Emotionally Maladjusted	1.97		1.60		3.70					
Speech Handicapped	—		1.62		1.25	1.36				
Blind	1.83		—		3.48					
Deaf	—		1.05		3.15					
Partially Sighted	1.83		1.79		3.48					
Hard of Hearing	3.03		1.62		3.15					
Orthopedically Handicapped	1.75		1.54		3.20					
Multiple Handicapped	—		1.65		2.80					
Secondary Programs	1.51	(7-12)	1.80	(9-12)		2.30	(7-9)	2.71	(10-12)	1.88
Gifted	—		1.49		1.15					
Educable Mentally Retarded	1.35		1.49		1.92					
Trainable Mentally Retarded	1.24		1.43		2.20					
Learning Disabilities	2.25		—		2.50					
Socially & Emotionally Maladjusted	1.96		1.35		3.70					
Speech Handicapped	—		1.91		1.25	1.52		1.37		
Blind	2.48		—		3.48					
Partially Sighted	2.48		1.70		3.48					
Deaf	—		1.22		3.15					
Hard of Hearing	3.05		1.25		3.15					
Orthopedically Handicapped	1.33		—		3.26					
Multiple Handicapped	1.65		—		2.80					
Occupational Programs	1.60		1.55							

* Elementary & secondary levels were not distinguished and the base cost was 1-12 inclusive.

**Elementary, middle, & secondary levels were distinguished and the base cost was the elementary level.

***Elementary & secondary levels were not distinguished and the base cost was the elementary level.

TABLE 7: Cost Indices of Special Education Elementary and Secondary Programs in Idaho and Pennsylvania.

	A		B	
PROGRAM	Elem.[C]	Second.[C]	Elem.	Second.
Educable Mentally Retarded	2.38	1.66	2.98	2.92
Trainable Mentally Retarded	3.43	2.00	3.41	3.00
Auditorily Handicapped	7.11	4.00	2.52	2.18
Visually Handicapped	8.25	4.14	2.00	——
Physically Handicapped	3.64	3.25	——	——
Speech Handicapped	6.62	5.56	1.85	——
Special Learning Disorders	3.53	1.82	2.78	2.53
Emotionally Disturbed	4.45	2.87	2.39	2.65

A: Hayes, Robert and Cober, Pennsylvania education cost study of 1974-75. Reviewed in Appendix HA.

B: Schrag, Idaho special education study of 1972-73. Reviewed in Appendix SA.

[C] Cost of transportation not included, and therefore these cost indices were underestimations.

N.B. Both these studies compared the special elementary program to the regular elementary program and the special secondary program to the regular secondary program.

As one proceeds down the list of alternatives, the following tendencies may be observed:

- the programs are designed to meet increasingly complex educational needs.
- the demand for additional and more specialized personnel increases.

Very little cost research has been conducted on program delivery systems. This lacunae is doubly important because different delivery systems typically serve pupils of differing severities of handicap. Clemmons (Appendix CA) conducted one of the few studies addressing this issue. Six Minnesota school districts with exemplary special education programs comprised his sample. Based on a methodology similar to the NEFP one, the study reported the following median delivery system indices across all exceptionalities:

Regular Classroom
  - with special consultant: 1.86
  - with itinerant teacher: 1.50
  - with resource room: 2.00

Special Classroom
  - part-time: 1.66
  - full-time: 1.67

Homebound or Hospitalized: 1.34

Because the sample of school districts was small, these cost indices were tentative. However, they did indicate that the cost difference between special classrooms and regular classrooms supplemented with special services was relatively small. The advantages of the latter delivery system include the large number of pupils receiving some services and the integration of special and regular pupils.

3.5 Estimation of Cost Indices of Programs for Low Trainable Mentally Retarded Pupils

Cost estimates of programs for low trainable mentally retarded pupils typically with multiple handicaps generally were unavailable. Nevertheless, the few figures at hand coupled with a strong dose of mathematical estimation based on the Rossmiller cost indices, suggested a cost index of 4.00 as representative of all Low TMR programs. Until future cost research is conducted this overall estimate stands as our best approximation. The estimation procedure, results and evaluation are presented in the remainder of this section.

Cost indices of a few school programs for low trainable mentally retarded pupils were available, and are presented in Table 8. The Rossmiller indices are given for the sake of comparison. Austin Independent School District operated a pilot program which adopted a "zero reject" model. The goal of the program was to demonstrate the practical feasibility of training severely and profoundly multi-handicapped children in a public school setting. A cost index of 4.04 was attributed. Additional details may be found in Appendix AA.

Among the many special programs offered by New York City Board of Education were two programs for low trainable pupils: (1) Program for Doubly Handicapped/Mentally Retarded; and (2) Track IV Program which served profoundly retarded children many of whom were released recently from institutional care. The former program had a cost index of 4.20 and the latter an index of 4.05, giving a mean index of 4.13. Additional details may be found in Appendix NB.

Another cost estimate for Low TMR Programs was obtained through mathematical manipulation of the Rossmiller cost indices (see Table 2). These indices were based on a large (American) national sample of special programs exemplifying "best current practice". Therefore, we can safely assume that they are consistent estimates and may serve as an adequate base to estimate a cost index for Low TMR Programs.

The Rossmiller indices can be plotted along the dimension of Handicapped Condition (H = 7) as follows:

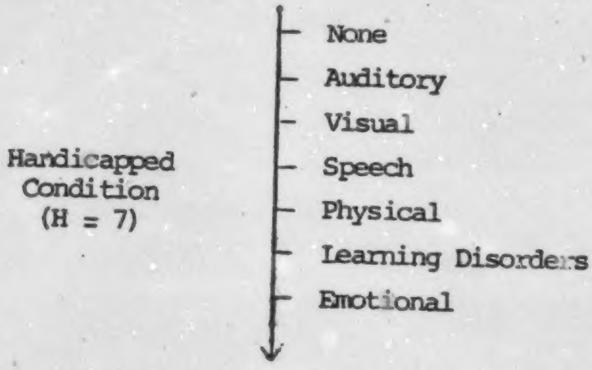


TABLE 8: Cost Indices of School Programs for Low Trainable Mentally Retarded Pupils

PROGRAM CATEGORY	N.Y. City Board Education[a] 1975-76	Austin Independent School District[b] 1975-76	NEFP Rossmiller Study[c] 1968-69
Educable Mentally Retarded	2.11	N.R.[e]	1.87
High Trainable Mentally Retarded [d]	2.78	2.63	2.10
Low Trainable Mentally Retarded[d]	4.13[f]	4.04	N.R.[e]

[a] Taken from Table NB 11.

[b] Taken from Table AA.

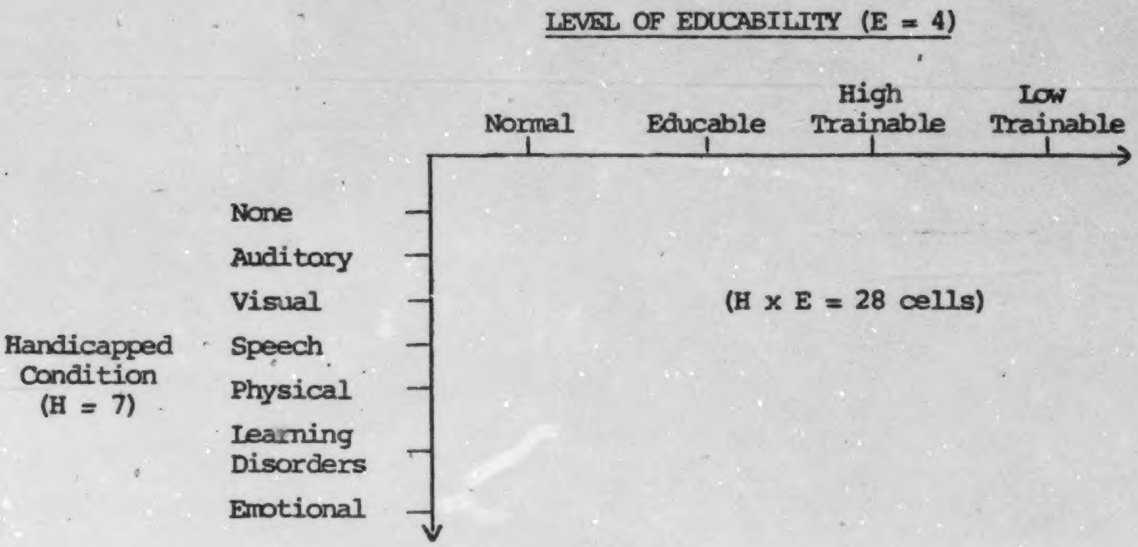
[c] Taken from Table 2.

[d] High TMR usually is referred to as simply TMR.
Low TMR refers to severely and profoundly MR with multiple handicaps.

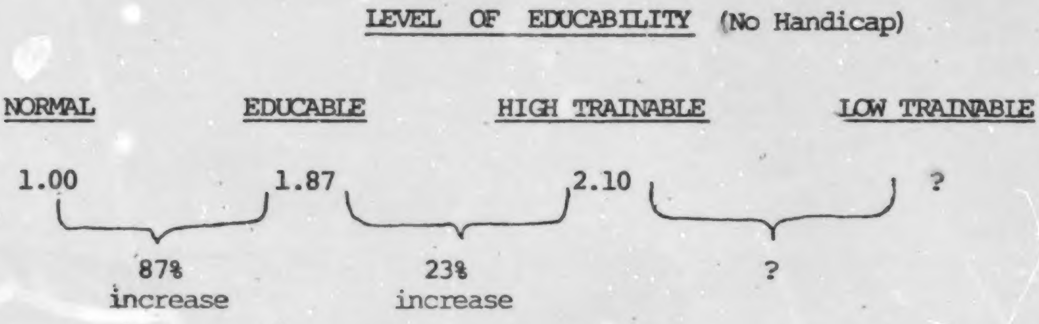
[e] N.R. - Not Reported.

[f] 4.13 was the mean of the Doubly Handicapped/Mentally Retarded Program (4.20) and the Track IV Program for the profoundly retarded (4.05).

This dimension assumes normal learning ability, that is a normal level of educability. The indices can also be plotted along the separate dimension of Educability (E = 4): Normal, Educable, High Trainable and Low Trainable. These two dimensions interact and create a matrix of 28 indices (H x E = 7 x 4) as follows:


LEVEL OF EDUCABILITY (E = 4)
Normal
Educable
High Trainable
Low Trainable
Handicapped Condition (H = 7)
None
Auditory
Visual
Speech
Physical
Learning Disorders
Emotional
(H x E = 28 cells)

Rossmiller indices for Normal, Educable and High Trainable levels of Educability with no handicap were available, leaving the index for Low Trainable with no handicap to be estimated. The indices were as follows:


LEVEL OF EDUCABILITY (No Handicap)
NORMAL
EDUCABLE
HIGH TRAINABLE
LOW TRAINABLE
1.00
1.87
2.10
?
87% increase
23% increase
?

Using the index for Normal (1.00) as base, it was noted that the index increased by 87% for Educable and by an additional 23% for High Trainable. Three possible increases were suggested for Low Trainable: 87%, 23% or the mean of these two 55%. The conservative increase 23% was adopted, representing an index of 2.33. This choice was defensible considering that handicap per se was represented in a separate dimension and would increase the cost indices of programs for Low TMR with Handicapped Conditions.

The cost indices for Handicapped Condition were available only for Normal level of Educability. Since several of these indices were substantial in magnitude (e.g., 2.99, 3.64), a conservative procedure was followed to obtain indices for Educable with Handicapped Conditions. If the index for Normal with handicap was greater than that for Educable with no handicap, the greater of the two was accepted without modification; if the index for Normal was smaller than that for Educable, the two were multiplied[3].

Some may argue that it is unreasonable to expect a special program (e.g., physically handicapped) to cost the same for a normal child and an educable child. The latter has an additional handicap which would require more staff expertise, more specialized equipment, in short, a more costly program. No doubt a different configuration of resources would be necessary, but it may be argued that the index for the normal program (3.64) would adequatly cover the costs. Since both positions are tenable, the more conservative is preferred.

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[3] The multiplication formula was applied only for Speech Handicap: 1.18 x 1.87 = 2.21.

The argument above for increased costs was accepted for High Trainable and Low Trainable with Handicaps because of their acute learning difficulties. The cost indices for High Trainable with Handicap were presumed to be 12.3% greater than the indices for Educable with Handicap. Similarly, the cost indices for Low Trainable with Handicap were presumed to be 12.3% greater than those for High Trainable with Handicap. These percentage increases were based on the following:

LEVEL OF EDUCABILITY (No Handicap)

EDUCABLE		HIGH TRAINABLE		LOW TRAINABLE
1.87		2.10		2.33
	12.3% increase		12.3% increase	

The index for Educable acted as base. The above relationship for No Handicap was applied throughout the dimension of Handicapped Condition.

The results fo this speculation are summarized in Table 9. The cost index for Low Trainable - No Handicap equalled 2.33. The remaining indices for Low Trainable with severe handicap ranged from 3.53 (Emotional Handicap) to 4.64 (Physical Handicap) with a mean value of 3.99, or simply 4.00. The mean index of 4.00 was accepted as the best single estimate for Low TMR with Handicapped Conditions, and was in line with the findings of the two studies presented in Table 8 for Low Trainable (i.e. 4.13, 4.04).

TABLE 9: Estimation of Cost Indices of Programs for Low Trainable Mentally Retarded Pupils Based on Rossmiller's Cost Indices.

HANDICAP	LEVEL OF EDUCABILITY			
	NORMAL	EDUCABLE	HIGH TRAINABLE	LOW TRAINABLE
None	1.00	1.87	2.10	2.33
Auditory	2.99	2.99	3.36	3.73
Visual	2.97	2.97	3.34	3.70
Speech	1.18	2.21	-----[b]	-----[b]
Physical	3.64	3.64	4.09	4.64
Learning Disorders[a]	2.16	-----[c]	-----[c]	-----[c]
Emotional	2.83	2.83	3.18	3.53

[a] Special Learning Disorders and Neurological Handicaps.

[b] Speech handicap is included in the profile of most trainable persons.

[c] Learning disorders are assumed at all levels of educability below normal.

N.B. The underlined cost indices were reported in the NEFP Rossmiller Study and were taken from Table 2. The remaining cost indices were estimated as explained in the text.

In summary the following cost indices were accepted as best estimates:

- Program for low trainable pupils with no (severe) handicap: 2.33
- Program for low trainable pupils with severe handicap(s) : 4.00

Cost Estimates from British Columbia. W/C Project[4] operating in the Lower Fraser Valley Region of British Columbia has made efforts to cost analyse its various programs. Tables 10 and 11 present costs of the community school programs in Coquitlam and Surrey. Cost indices were calculated and are presented in Table 12. The Coquitlam program for Low Trainable Mentally Retarded with no severe handicaps gave a cost index of 2.30. This value compared favorably with the best estimate of 2.33 for a similar program. The Surrey programs gave an overall index of 3.37; one program was attended by Low TMR students with no severe handicaps and the second program by Low TMR students with severe physical handicap. Again this figure was compatible with best estimates which gave an overall index of 3.17 (mean of 2.33 and 4.00) for two similar programs.

Various programs were operating within the institution staffed by New Westminster school district staff. The costs of these programs were difficult to analyse because ample use of institutional resources was encouraged and cost estimation of these resources was not performed

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[4] Woodlands/Community (W/C) Educational Services Project.

TABLE 10: Per Pupil Costs of Educational Services Purchased from Coquitlam School District for Woodlands Pupils[a], 1976-77 and 1977-78.

COST CATEGORY	PER PUPIL COST 1976 - 77	PER PUPIL COST 1977 - 78
1. Salaries and fringe benefits of Teachers and Teachers' Aides	$ 2,711.41	$ 2,535.46
2. Salary and fringe benefit of Speech Therapist	$ 362.68	$ 373.22
3. Teaching supplies and materials	$ 78.50	$ 53.76
4. Outdoor education, field trips, swimming instruction	$ 16.85	$ 7.10
5. Accommodations, Operating expenses	$ 340.45	$ 254.17
6. Furniture and equipment	$ 10.50	——
7. Transportation	$ 185.88	$ 248.27
8. Administration	$ 81.42	$ 81.96
TOTAL:	$ 3,787.69	$ 3,553.94

[a] Low trainable pupils with no severe handicaps.

N.B. 1976-77 figures were taken from the W/C Project Report (Year 1) September 1977. The 1977-78 figures were obtained from an in-house cost accounting report completed by the Project Research Officer.

TABLE 11: Per Pupil Costs of Educational Services Purchased from Surrey School District for Woodlands Pupils[a], 1976-77 and 1977-78

COST CATEGORY	PER PUPIL COST 1976 - 77	PER PUPIL COST 1977 - 78
1. Salaries and fringe benefits of Teachers and Teachers' Aides	$ 2,735.75	$ 3,311.59[b]
2. Salary and fringe benefits of Speech Therapist, and Occupational Therapist	$ 339.21	$ 1,086.14[c]
3. Teaching supplies and materials	$ 12.85	$ 28.11
4. Outdoor education, field trips, swimming instruction	——	——
5. Accommodations, Operating expenses	$ 1,074.47	$ 934.13[d]
6. Furniture and equipment	——	——
7. Transportation	$ 613.00	$ 115.54[e]
TOTAL:	$ 4,775.28	$ 5,475.51

[a] One full-time class of low trainable pupils with no severe handicaps and one full-time class of low trainable pupils with severe physical handicaps.

[b] Excluding staff development.

[c] The substantial increase over 1976-77 was due to the presence of the speech therapist for the entire school year and the commencement of occupational therapy services.

[d] Rental of two portables.

[e] The substantial decrease over 1976-77 was due to the utilisation of an institutional bus with no cost to the school district.

N.B. 1976-77 figures were taken from the W/C Project Report (Year 1), September 1977. The 1977-78 figures were obtained from an in-house cost accounting report completed by the Project Research Officer.

TABLE 12: Cost Indices of W/C Programs in Surrey and Coquitlam School Districts, 1977-78.

SCHOOL DISTRICT	TOTAL OPERATIONAL COST PER PUPIL REGULAR PROGRAM (1)	 LOW TMR PROGRAM (2)	COST INDEX (2)/(1)
Coquitlam	\$ 1542[a]	\$ 3554[b]	2.30
Surrey	\$ 1623[a]	\$ 5476[c]	3.37

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[a] Operating budgets per FTE pupil were given as \$1,665 and \$1,753 for Coquitlam and Surrey School Districts respectively in EDUCATION TODAY, Vol. 4 (9), June 1978, for the 1977-78 school year. These figures were assumed to represent 108% of the 1977-78 costs and were adjusted accordingly. These figures are probably overestimation because expenditure items probably were included which are deleted according to the Rossmiller Method.

[b] Several classes of pupils without severe handicaps.

[c] One class of pupils without severe handicaps and one class of pupils with severe physical handicaps.

and may have been unfeasible. Also pupil enrollment was in flux because these programs were still in the early stages of implementation. An attempt to circumvent these constraints took place by calculating costs per pupil-program hour for instructional staff only and corresponding cost indices. These results are presented in Table 13.

As a test of the unit of scale of the cost index based on per pupil-program-hour, the indices so calculated were compared to the indices calculated by the standard method, that is based on the yearly per pupil total operational cost. The Coquitlam TMR program resulted in a cost index equal to 2.3 based on the Rossmiller method (see Table 12), and an index equal to 3.5 based on instructional cost per pupil-program-hour (see Table 13). A similar comparison was found for the Surrey programs, that is an index of 3.37 calculated by the Rossmiller method (see Table 12), compared to 5.75 calculated by pupil-program-hour. The figure 5.75 was obtained by averaging the two indices given in Table 13 for the Surrey programs that is, 4.9 and 6.6. In summary, the cost indices calculated on instructional cost per pupil-program-hour were substantially larger than the indices calculated by the standard Rossmiller method. The magnitude of the indices were in the expected direction, that is the Surrey programs obtained a higher cost index (5.75) than the Coquitlam programs (3.5). In conclusion, the indices of Table 13 are not comparable to those calculated by the Rossmiller method and are over estimations. Nevertheless, they can be used as a relative indication of the magnitude of cost of the different programs. Some programs very well may have a cost index of 6.0 or more calculated by the Rossmiller Method.

TABLE 13: Costs and Cost Indices of Instructional Staff of W/C[a] Programs for Low Trainable Mentally Retarded Pupils Based on Pupil-Program Hours, 1977-78

PROGRAM CATEGORY	COST PER PUPIL-PROGRAM HR.	COST INDEX
Regular (C)	$ 0.64[b]	
Low Trainable Mentally Retarded (C)	$ 2.26	3.5
Low Trainable Mentally Retarded (S)	$ 3.16	4.9
Low Trainable Mentally Retarded (NW)	$ 4.34	6.8
Deaf (NW)	$20.79	32.5
Blind (NW)	$ 5.20	8.1
Physically Handicapped (NW)	$ 3.41	5.3
Physically Handicapped (S)	$ 4.21	6.6
Emotionally Disturbed (NW)[c]	$ 8.16[c]	12.8
Emotionally Disturbed (NW)[d]	$18.64	29.1
Developmental (NW)[e]	$12.64	19.8

[a] W/C: Woodlands/Community Educational Services Project.

[b] A class size of 24.7 pupils per teacher was utilised as reported in EDUCATION TODAY, Vol. 4 (9), June 1978, and a standard of 100 program hours per pupil per month. The figure $0.64 was used as denominator in calculating the cost indices.

[c] Autistic program. Two nursing staff were assigned to the program and were not included in the cost figure.

[d] Behavior modification program.

[e] The Early Learning Program (TELP)

N.B. Programs staffed by Coquitlam (C) and Surrey (S) School Districts were situated in community schools whereas programs with New Westminster (NW) school district staff took place within Woodlands Institution. The average monthly teacher salary ($1,585 including 4% benefits) and teachers' aide salary ($940 including 4% benefits and 6% vacation pay) of N.W. staff were applied to all programs.

When examining Table 13, one must keep in mind that these indices assume full-time equivalent attendance by pupils. Instruction for low trainable pupils enrolled in deaf, blind, emotionally disturbed or developmental programs, all at an intensive one-to-one ratio, is not given for a full school day because it would be exhausting both to the pupil and the instructor. Part-time pupil attendance would have to be transformed into full-time equivalent attendance to utilise the cost indices. This proviso applies to all cost indices in this report.

The possibility was entertained that the cost index based on yearly instructional cost per pupil (instead of yearly operational cost per pupil) might shed some light on the results of Table 13. Cost indices were calculated according to this method for eight different programs in seven school districts based on the appendices in Rossmiller's NEFP Study. The ratio of the index calculated on instructional costs over the index based on total operational costs was considered a measure of comparability of values. For example a ratio of one (1) would indicate that the cost index calculated by either method was identical; a ratio of less than one (e.g., .50) would mean that the index calculated on yearly instructional costs underestimated the magnitude of the index based on yearly operational costs; and a ratio of more than one (e.g., 1.50) would indicate overestimation. The closer the values are to one, the more the two methods of calculating cost indices give the same result. The findings were consistent in that 24 of the 44 ratios calculated were between .90 and 1.10, the full range was .46 to 1.24 with a mean of 0.95.

These results strongly support the conclusion that cost indices calculated by either using yearly instructional costs or yearly operational costs would be of similar magnitude in most cases. Therefore, we are in no better position to analyse the results of Table 13 which gives cost indices based on costs per pupil-program hour.

Falling back on Table 9 as supplying best estimates, a cost index of 2.33 is recommended for a Low Trainable Program with no severe handicap, and an index equal to 4.00 for Low Trainable Program with severe handicap. Because some programs can be expected to require an index substantially higher than 4.0 (see discussion on Table 13), an overall cost index of 4.0 is recommended for all Low TMR Programs.

3.6 Applicability of Cost Indices

The use of cost indices was introduced with hope and caution. Rossmiller (Appendix RD) claimed that the cost index was stable over time relative to the normative and changing demands upon a school district's resources. We may assume that this attributed virtue was due to the fact that the index was a ratio of per pupil costs of a special program over per pupil costs of the regular program, and what affected the numerator would similarly affect the denominator. However, he cautioned that a significant change in a district's staffing pattern (e.g., lower pupil-teacher ratios, employment of teacher aides, etc.) could lead to a significant change in the cost index. Comparing the pupil-teacher ratio of the regular program reported by Rossmiller to that of Coquitlam and Surrey School Districts, it was found that the values were very close, namely 22.8 for the former compared to 24.7 and 23.5 for the latter[5]. In addition, the B.C. provincial average was 23.6. Also, pupil-teacher ratios are expected to decline in the near future with declining enrollments. At first sight, it would appear that the Rossmiller indices are applicable to the province of British Columbia. The ratio of costs instead of costs per se also avoids the problem of comparing costs in different currencies.

Additional cautions were noted by Rossmiller and Moran (Appendix RC). Firstly, the cost index is an average value which permits more accurate estimates of the amount of revenue needed at the state level to provide adequately for pupils with particular special educational needs. However, this same index is a poor basis for estimating needed funds at the district level. This point may be underlined with an example; the recommended Rossmiller cost index for TMR programs was 2.10 while the actual range of indices across school districts was from 1.18 to 3.62. Secondly, the cost indices typically do not reflect the effectiveness or efficiency of the regular and special programs upon which they are based. At best they reflect best current practice. Finally, identical programs may differ in cost between districts. Diseconomies of scale and differing levels of cost of living are among the responsible factors.

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[5] EDUCATION TODAY, Vol. 4 (9), June 1978. Class-sizes given for Sept. 1977.

Jones and Wilkerson (Appendix JA) noted that differences in program approach and services can cause extreme variability in program costs. Similarly, Bentley (Appendix BA), in his analysis of the cost data of the Rossmiller NEFP study, commented that the wide variations of cost indices within and between programs probably were caused by the lack of distinction between different delivery systems and degrees of handicapping conditions. It follows that if considerable changes take place in the method of program delivery and/or in the types of students served, the cost index will change. The NEFP study dealt mostly with self-contained programs except for Speech which was an addition to another program. In contrast, the little information available on cost indices of different delivery systems has indicated a narrow range of indices, from 1.50 for regular classroom with itinerant teacher to 2.00 for regular classroom with resource room; the self-contained special classroom had an index of 1.67 (Appendix CA).

The Rossmiller study was conducted on data for the 1968-69 school year. Though the cost index may be stable over short periods of time, an unstable index over long periods may be expected because of fundamental changes in district practice (e.g., lower pupil-teacher ratio). A recent study by New York City Board of Education (Appendix NB) addressed this question by comparing the 1975-76 per pupil costs calculated according to Rossmiller's method to the per pupil costs generated by multiplying the per pupil regular cost by the Rossmiller cost indices. The results of this comparison are presented in Table 14. Poor fit was evident for Special Learning Disorders (56% underestimation) which was explained by the high severity of handicap involved. Since special learning disorders was not considered an "aidable" category by New York State, the less severely handicapped within this category were not provided with special education services. Poor fit was also found for Multiple Handicapped (90% underestimation). However, Rossmiller warned against utilising that cost index as it was based on a very small sample. Discounting these two poor fits, and remembering the author's warning that the New York costs were slightly inflated, the overall fit appears faily good. In this case, the Rossmiller indices succeeded in predicting actual costs over an eight (8) year interval and therefore has shown considerable stability.

This same study by the New York City Board of Education calculated cost indices by three methods (1) All-inclusive Method which considered all funds received and spent regardless of whether expenditures were aimed primarily at serving the educational purpose, (2) Basic Education Method which excluded certain non-educational expenditures (e.g., Youthful Drug Abuser Program), and (3) the Rossmiller Method with its rigorous exclusion of

TABLE 14 (NB 8)

COMPARISON OF ROSSMILLER METHOD EXPECTED COSTS AND NEW YORK CITY ACTUAL COSTS FOR HANDICAPPED CHILDREN,

1975 -76

	NYC ACTUAL ROSSMILLER METHOD COST	ROSSMILLER EXPECTED COST	PERCENT DIFFERENCE
Educable Mentally Retarded	$ 3,909	$ 3,465	+ 13%
Trainable Mentally Retarded	4,947	3,891	+ 27
Auditorily Handicapped	5,593	5,540	+ 1
Visually Handicapped	5,558	5,503	+ 1
Physically Handicapped	6,342	5,745	- 6
Speech Handicapped	2,041	2,187	- 7
Special Learning Disorders	6,241	4,002	+ 56
Emotionally Disturbed	5,767	5,244	+ 10
Multiply Handicapped	9,605	5,059	+ 90

expenditures not related to the core educational program. Methods 1 and 2 gave fairly similar cost indices, whereas the Rossmiller Method resulted in consistently higher cost indices (see Table NB 9). Though the authors preferred the indices based on the Basic Education Method for internal cost estimates, they admitted that the Rossmiller Method alone permitted comparisons across different school districts. Their use of three methods in calculating the cost index also demonstrated that varying the expenditure items included affects the value of the index.

The cost indices are based on cost per full-time equivalent (FTE) student. In practice, many pupils receive part-time services. For example, the Massachusetts Department of Education reported a total of 38,244.5 FTE special education students for 1975-76 (Appendix MB). This figure actually represented 148,615 students, that is approximately 4 students for each FTE student. Some program prototypes had students attending almost full-time and had a one-to-one relationship between number of students and FTE students; Prototype No. 502.4 (Substantially separate program) had 12,013 students or 10,031 FTE students. In contrast, the regular day program with modifications (No. 502.1) had 16,483 students which equalled to 2,031 FTE students receiving special services, that is, 8 students for each FTE student. Since different programs usually vary in cost, attendance figures in the various programs first must be transformed in FTE figures to make use of the cost indices. Though this adjustment requires no great amount of computation, some school districts may not have the necessary information collection system operating on the basis of program type. These districts would have the additional task of developing a detailed information system before cost indices could become a useful planning tool.

In conclusion, the Rossmiller cost indices are useful in determining approximate costs of special education programs in British Columbia as a whole. The cost index could be a more accurate cost measure if more were known on the costs of educating pupils with different severity of handicap and the costs associated with different program delivery systems.

3.7 Pupil-Teacher Ratios

Pupil-teacher ratios are influenced by numerous factors such as district policy, availability of funds, past practice, and current best practice. In the context of costs, the question of the appropriate size of pupil-teacher ratios and use of aides is important because instructional staff account for a large proportion of the cost index. Since little program evaluation has taken place with a focus on resource configurations, no valid information is available to aid decision-making. Meanwhile, reliance on best current practice offers a safe middle-course.

The Rossmiller NEFP Study presented actual pupil-teacher ratios found in their sample of school districts (Table 15), as well as idealized pupil-teacher ratios recommended by teachers (Tables 16 and 17). Comparison of the range of actual and idealized ratios were similar for Educable Mentally Retarded and Auditorily Handicapped. All other programs showed a wider range of actual teacher-pupil ratios. Comparison of mean pupil-teacher actual and idealized ratios demonstrated good fit. That is, the average pupil-teacher ratios in practice were similar to the recommended pupil-teacher ratios. The notable exception was the program for trainable mentally retarded persons which had a higher average pupil-teacher ratio in practice (12.8) than recommended (9.0).

Use of teachers' aides was highly recommended for programs for TMR, Blind, Deaf and Physically Handicapped. However, only the latter two actually made extensive use of aides. Again the program for trainable mentally

TABLE 15 . Statistics on Pupil-Teacher Ratios of Special Education Programs Based on Data Reported by Rossmiller, 1968-69

PROGRAM CATEGORY	NO. OF SCHOOL DISTRICTS REPORTING	RANGE OF PUPIL-TEACHER RATIOS	MEAN PUPIL-TEACHE RATIO
Educable Mentally Retarded	21	10.7 - 15.9	13.3
Trainable Mentally Retarded	20	7.6 - 17.0	12.8
Auditorily Handicapped	16	4.3 - 12.3	8.2[a]
Visually Handicapped	16	1.8 - 13.8	8.3
Physically Handicapped	12	5.5 - 20.0	11.7[b]
Speech Handicapped	18	14.6 - 137.0	71.0[c]
Special Learning Disorders	19	4.0 - 16.4	9.4[a]
Emotionally Disturbed	13	2.7 - 16.5	8.2
Regular	17	16.6 - 27.0	22.8

[a] Programs for the Auditorily Handicapped and Special Learning Disorders made extensive use of teachers' aides for low pupil-teacher ratios. It was concluded that two groups of pupils of differing intensity of handicap were being served in each of these programs.

[b] Extensive use of teachers' aides unrelated to size of pupil-teacher ratio.

[c] Itinerant services

N.B. These statistics were based on Table RD 31.

TABLE 16: Idealized Pupil-Teacher Ratios for Self-Contained Special Education Programs as Reported by Rossmiller, 1968-69.

PROGRAM CATEGORY	LEVELS Prim.[b]	 Inter.	 Middle	 Second.
Educable Mentally Retarded	9	11	14	17
Trainable Mentally Retarded	8[a]	8[a]	10[a]	10[a]
Severely Auditorily Handicapped	5[a]	5[a]	12[a]	12[a]
Mildly Visually Handicapped	10	10	15	IS
Severely Visually Handicapped	7[a]	10[a]	IS	IS
Physically Handicapped[c]	12[a]	12[a]	12[a]	12[a]
Speech Handicapped	IS	IS	IS	IS
Special Learning Disorders	8	8	8	8
Emotionally Disturbed	5	6	10	10

[a] Assumes the presence of a full-time teachers' aide.

[b]

Level	Ages
Elementary	6 - 12
- Primary	6 - 9
- Intermediate	10 - 12
Secondary	13 - 19
- Middle	13 - 15
- Secondary	16 - 19

[c] Assumed to be normatively educable.

IS: Itinerant services only.

TABLE 17: Idealized Itinerant Caseloads per Week for Special Education Programs as Reported by Rossmiller, 1968-69

PROGRAM	ELEMENTARY	SECONDARY
Visually Handicapped	-	60[a]
Speech[b]	50 - 75	50 - 75
Special Learning Disorders	10	10
Emotionally Disturbed	12	15

[a] A daily caseload of 12 pupils was recommended.

[b] Speech Therapy provided the principal instructional vehicle for rehabilitating the mildly auditorily handicapped.

N.B. The figures given were based on the mode (i.e., most frequently mentioned) response of teachers operating that program.

retarded persons was singled-out because teachers' aides were recommended and none were actually utilized.

Other sources of recommended and actual pupil-teacher ratios were available and are presented in Tables 18 and 19. Again, variations occurred both in the size of the pupil-teacher ratios and the use of teachers' aides. Tables 15 to 19 were combined to yield a composit summary for self-contained programs which is presented in Table 20. Several different practices were noted. Most program categories had the option of either using teachers' aides or not. In the case of Educable Mentally Retarded and Physically Handicapped, utilizing aides permitted a higher pupil-teacher ratio. Many other program categories retained the same pupil-teacher ratio in the presence of an aide (e.g.,High TMR, Special Learning Disorders); this practice may have reflected either more severely handicapped pupils or more intense programming. Programs for severely auditorily or visually handicapped pupils and low trainable mentally retarded pupils always used teachers' aides.

Table 20 may be used as a guide to appropriate pupil-teacher ratios and utilization of teachers' aides. Applied research is required before standards can be specified that are based on other grounds that opinion and current practice.

TABLE 18: Teacher-Pupil Ratios in Los Angeles City Unified School District and State of Pennsylvania'1975-76

PROGRAM CATEGORY	A (3-8yrs)	A (9-20yrs)	B Elem. (6-12yrs)	B Second. (13-19yrs)
Educable Mentally Retarded	15	18	9.7	9.2
Trainable Mentally Retarded	12	12	9.0	11.2
Deaf	6	8	—	—
Severely Hard of Hearing	8	10	—	—
Both Deaf and Severely Hard of Hearing	6	8	—	—
Blind	8	10	—	—
Partially Seeing	10	12	—	—
Both Blind and Partially Seeing	8	10	—	—
Physically Handicapped	—	—	8.2	7.0
Special Learning Disorders	6	8	7.5	7.9
Emotionally Disturbed	6	6	7.1	6.2
Deaf-Blind	3	5	—	—
Other Multi-handicapped	6	8	—	—

A Recommended maximum pupil-teacher ratios in Los Angeles City Unified School District, 1975-76. The figures assume a teachers' aide for each teacher. Reviewed Appendix IB.

B Actual pupil-teacher ratios in a representative sample of classes in Pennsylvania during 1975-76. No mention was made of teachers' aides. Reviewed in Appendix HA. The above figures were calculated by dividing the average class cost (Table HA3) by the average cost per pupil (Table HA4)

TABLE 19 (CB 7): Average Yearly Caseloads for Teachers by Delivery Systems in Colorado, 1974-75

Program Category	Itinerant/ Consultant Services	Resource Room	Self-Contained Special Class
Limited Intellectual Capacity	34.8	19.4	12.0
Emotional/Behavioral	492.3	27.4	11.5
Perceptual/Communicative	17.2	17.8	43.2
Hearing Handicapped	14.7	10.0	7.2
Visually Handicapped	13.7	5.3	—
Physically Handicapped	30.0	13.7	12.1
Speech	74.1	49.6	—
Pregnant Girls			17.5
Adjudicated Youth			—
Autistic			9.3
Deaf/Blind			3.3
Multiply Handicapped			8.0

N.B. Instructional staff was composed of 2,052 FTE teachers and 215 FTE teachers' aides.

TABLE 20: Summary of Recommended and Actual Teacher-Pupil Ratios in Special Education Self-Contained Programs

Program Category	Elem.	Second.
Educable Mentally Retarded	10 (15[a])	12 (18[a])
High Trainable Mentally Retarded	10 (10[a])	11 (11[a])
Low Trainable Mentally Retarded[b]	6[a]	6[a]
Severely Auditorily Handicapped	6[a]	10[a]
Mildly Visually Handicapped	10 (10[a])	12 (12[a]) (IS)
Severely Visually Handicapped	8[a]	10[a] (IS)
Physically Handicapped	8 (12[a])	7 (12[a])
Speech Handicapped[c]	IS	IS
Special Learning Disorders	8 (6[a])	8 (8[a])
Emotionally Disturbed	6 (6[a])	9 (6[a])
Deaf/Blind	3 (3[a])	3 (5[a])
Other Multiple Handicapped	8 (6[a])	8 (8[a])

[a] Assumes availability of Teachers' Aide.

[b] The pupil-teacher ratios were obtained from Austin Independent School District programs reviewed in Appendix AA, and from Maryland State Department of Education demonstration project reviewed in Appendix IA. One-to-one and two-to-two ratios were reported for the lowest levels of programming with a gradual increase to six pupils to one teacher with an aide.

[c] Includes Mildly Auditorily Handicapped.

4.0 Incidence Rates of Handicapped Conditions

For the purpose of this section, handicapping conditions and program categories were interchangable. In other words, persons with a particular handicapping condition were the same persons attending an educational program titled by that handicapping condition. However, in reporting incidence rates of handicapping conditions, some handicapped persons were included who were not, but should have been, receiving special education services.

Bernstein (Appendix BC) noted that most estimates of incidence rates were based partly on empirical evidence and partly on the judgement of the estimator. Incidence rates were simply expected prevalences. The principal variation in estimates was the result of how narrowly or broadly the state defined handicapping conditions. This was particularly true of functional disorders (e.g., learning disabilities, emotional disturbance) as opposed to organic disorders (e.g., blind, deaf). Table 21 presents five estimates of the incidence of handicapped conditions as an illustration of the extreme variations that do occur.

TABLE 21 (BC3)

Various Incidence Rates for Handicapping Conditions

Handicapping condition	*Hawaii*	*NEFP*	*BEH*	*North Dakota*	*New York*
Mentally retarded	1.95%	1.5[illegible]%	2.300%	2.25%	2.300%
Learning disabled	2.00	1.12	1.000	5.00	26.000
Emotionally handicapped	.10	2.00	2.000	3.00	2.000
Speech impaired	3.00	3.60	3.500	5.00	3.500
Visually impaired	.03	.05	.100	.08	.100
Hearing impaired	.20	.10	.575	2.10	.575
Crippled and physically handicapped	.10	.21	.500	.50	.500
Multihandicapped and other	.01	.07	.060	.50	.070
Total	7.39%	8.69%	10.035%	18.43%	35.045%

Note. The data in column 1 are from Management Analysis Center (1974); column 2 Rossmiller et al. (1970); columns 3 and 4 Kakalik et al. (1973); and column 5 New York State Commission (1973). Figures in column 5 are a liberal estimate; the actual rate used by the Commission in its report was 9.275%.

The incidence rates adopted in this study were based primarily on two widely quoted American national studies, namely the Rossmiller NEFP Study (Appendix RD) and the study of "Services for handicapped youth" by Kakali and associates (Appendix KA), both of which were sponsored by the Department of Health, Education and Welfare. In general, the incidence rates supported by these two studies were averaged to obtain best estimates.

Incidence rates of mental retardation are presented in Table 22. Canadian national rates quoted by the B.C. Association for the Mentally Retarded were included for comparison sake, and were used to help estimate the prevalence of the Low Trainable category. The Canadian estimates were not preferred because no epidemiological studies were conducted. The best estimates resulted in a total of 1.96% of the population as mentally retarded, or more specifically, as requiring special services for the mentally retarded. Incidence rates of all handicapped conditions totalled 9.38% which was very close to the often-quoted 10% (Table 23).

4.1. Applicability of Incidence Rates

The applicability of these best estimates to British Columbia may be criticised on a couple of points. Firstly, these estimates are based on American national studies, not Canadian studies. Secondly, even if these estimates are applicable to Canada as a whole, they may be poor estimates for the region of British Columbia. In support of the latter, the number of severely and profoundly retarded children of school-age at Woodlands was estimated at 179 in January 1979. Conservatively, 150 of these would be in the low trainable range. According to the projected

TABLE 22: Best Estimate of Incidence Rates of Mental Retardation as Percent of Population

LEVEL OF RETARDATION	B.C. Assoc. for M.R.[a] (A)	Rossmiller (1970) (B)	Kakali (1973) (C)	Best Estimate (B + C)/2
Educable	2.55%	1.30%	1.94%	1.62%
High Trainable	0.39%	0.24%	0.36%	0.30%
Low Trainable	0.06%	N.R.[b]	N.R.[b]	0.04%[c]
TOTAL:	3.00%	1.54%	2.30%	1.96%

[a] B.C. Association for the Mentally Retarded quotes a national figure of 3% of the population exhibiting mental retardation. 85% of this 3% is assumed to fall into the "mild" or Educable category, 13% into "moderate" or High Trainable, and 2% into "severe and profound" or Low Trainable.

[b] N.R. : Not Reported.

[c] This estimate of Low Trainable was calculated as follows:

$$\frac{(2.55 + 0.39)}{0.06} = \frac{(1.62 + 0.30)}{x}$$

$$x = 0.04$$

TABLE 23: Best Estimate of Incidence Rates of Handicapped Conditions as Percent of Population

HANDICAPPED CONDITION	Rossmiller Rates (A)	Kakali Rates (B)	Best Estimates (A + B)/2
Educable Mentally Retarded	1.30%	1.94%	1.62%
High Trainable Mentally Retarded	0.24%	0.36%	0.30%
Low Trainable Mentally Retarded	N.R.[a]	N.R.	0.04%[b]
Auditorily Handicapped	0.10%	0.58%	0.34%
Visually Handicapped	0.05%	0.10%	0.08%
Speech Handicapped	3.60%	3.50%	3.55%
Physically Handicapped	0.21%	0.50%	0.36%
Special Learning Disorders	1.12%	1.00%	1.06%
Emotionally Disturbed	2.00%	2.00%	2.00%
Multiple Handicapped	0.07%	0.06%	0.03%[c]
TOTAL:	8.69%	10.04%	9.38%

[a] N.R.: Not Reported.

[b] See Table 22.

[c] Excluding multiple handicapped mentally retarded persons represented in Low Trainable category.

incidence of low trainable children (Table 25) this would leave only 57 outside Woodlands in the Province - a figure which seems intuitively rather low. Also Froomkin, Endriss and Stump (Appendix FC) argued that incidence rates of handicapped conditions varied by region (e.g. Northeast) and by district (e.g. inner city) in the United States. Despite these objections, utilization of the best estimates presented is defensable in the absence of epidemiological studies conducted in British Columbia.

Incident rates applicable on a provincial level probably could not be applied uniformly across localities. Gray (1973) found that school districts in the San Antonio, Texas area had a higher than expected population of handicapped pupils attributed to military families. He argued that since many services for exceptional children were not available in rural areas, particularly for children with low incidence exceptionalities, major business, industries, and the military transferred personnel to areas where appropriate services were available. The result was a skewed distribution of exceptional pupils.

Miles (Appendix MD) has hypothesized that straight-line projections of fixed incidence rates are poor estimates because of (a) the criteria upon which incidence rates are established, (b) the changing rate of remediation, (c) the changing rate of new entries into the educational system and (d) the changing rate of reentries of previously remediated students. Other authors have supported Miles directly and indirectly (Appendices BC, FC and MA) and were summarized below along with additional points.

With pre-school services for ages 0 to 4 increasingly offered to handicapped children, the extent of disability may be limited so that these children are able to function in later years in a regular education program (perhaps with special education support) rather than in a special education class. Similarly, prevention programs at the prenatal stage (e.g., adequate nutrition and medical care) may succeed in diminishing the overall incidence of handicap as well as decreasing the severity of handicap. Socio-economic and educational improvements also would tend to decrease incidence rates of handicapped conditions. However, the converse is equally true, that certain broad factors may increase incidence rates and severity of handicap. Disproportionate decrease in birth rates in the upper and middle class compared to the lower class may increase incidence of handicaps; poverty is strongly associated with inadequate nutrition. The possibility of dramatic negative influences exists due to the widespread consumption of drugs with the consumption of thalidomide by pregnant mothers as a striking example.

A more fundamental issue is the distinction between handicap and disability. In general the incidence of handicap is greater than the incidence of disability; some handicapped persons succeed independently in adapting to personal and social needs. In a more tolerant and supportive era, the number of handicapped persons succeeding relatively independently likely would increase. Also not all handicapped persons can benefit from special education services, that is optimal ages exist for particular services. For example, Craig & McEachron (1974) have presented research evidence that indicate in the majority of cases children over 12 years old benefit little from services for speech impairments. Therefore, applying an incidence rate for speech impairment to the population up to age 18 or 21 would seem to greatly overestimate the current need for those particular special services.

The conclusion is inevitable that estimating incidence rates of handicapping conditions should be an on-going research topic. No matter how valid present incidence rates are, in time they will become invalid unless the many factors influencing them are taken into consideration.

5.0 BASIC PLANNING PACKAGE—REQUIRED FINANCE FOR SPECIAL EDUCATION PROGRAMS FOR MENTALLY RETARDED CHILDREN

In this section, the previous sections are pulled together to arrive at the required level of finance for the funding of special education programs for mentally retarded children in British Columbia.

The first step involves determining the cost of educational programs on a per FTE pupil basis. Table 24 demonstrates how the cost indices can be used to arrive at program costs as well as marginal program costs with respect to the regular program. In the second step, these program costs are multiplied by the number of pupils requiring those special education programs. With a knowledge of incidence rates of handicapped conditions and the number of school-age persons in the total population, the number of children requiring special education services is calculated. These operations are displayed in Table 25 for programs for mentally retarded children. Total marginal costs can be calculated in the same manner.

Many of these mentally retarded children already are receiving special education services, that is, the educable and high trainable children. Low trainable children as a rule are not admitted to public schools. If all pupils were served by school districts, additional finance would be required for the funding of Low TMR Programs, Estimated at $1,407,600 for the entire province. This figure does not include start-up costs.

The school-age population was defined as 5 to 18 years of age. Thus, the much needed pre-school (0-4) and post-school (19-25) programs for low trainable persons are not included in the estimation of required finance.

TABLE 24: Anticipated Per FTE Pupil Cost and Marginal Cost in Special Education Programs for Mentally Retarded Children in British Columbia, 1978-79.

Program Category	Cost Index (A)	Regular Program Cost (B)[a]	Special Program Cost (A x B = C)	Marginal Cost of Special Program (C - B)
Educable Mentally Retarded	1.87	$1700	$3179	$1479
High Trainable Mentally Retarded	2.10	$1700	$3570	$1870
Low Trainable Mentally Retarded	4.00	$1700	$6800	$5100

[a] The provincial average operating cost per FTE pupil was quoted as $1,823 for 1978-79 in EDUCATION TODAY, Vol. 4 (9), June 1978. This figure was based on total budgeted operating costs and probably included expenditure items deleted according to the Rossmiller Method. $1,823 was arbitrarily adjusted to $1,700. A more precise figure may be substituted at a later date, with corresponding adjustments in special costs and marginal costs.

N.B. Method presented was taken from Rossmiller (Appendix RD).

TABLE 25: Level of Finance Required for Special Education Programs for Mentally Retarded Children, 1978-79

Program Category	Cost per Pupil (A)	Incidence of Handicapped Conditions[a] (B)	No. of pupils with Handicapped Conditions[b] (C)	Level of Finance Required (A x C)
Educable Mentally Retarded	$3179	1.62%	8,388	$26,665.452.
High Trainable Mentally Retarded	$3570	0.30%	1,553	$ 5,544,210.
Low Trainable Mentally Retarded	$6800	0.04%	207	$ 1,407,600.
TOTAL:	NA	1.96%	10,148	$33,617,262.

[a] As percent of population.

[b] The population of British Columbia was 2,529,900 as of April, 1978, based on Statistics Canada estimates. British Columbia Ministry of Education estimated the school-age population (approx. 5-18 years of age) including kindergarten to be 517,767 in 1978.

These programs also may benefit less severely retarded pupils. Considerable additional finance may be required to extend services to all younger and older mentally retarded pupils who could benefit.

Though level of finance required was calculated only for programs for mentally retarded pupils, it could have been calculated for the entire handicapped pupil population, using the cost indices in Table 2 and the best estimate of incidence rates in Table 23. Before calculating required level of finance, the incidence of multiple handicapped conditions would have to be partitioned to other categories because no corresponding program category was presented.

The estimate of required finance is only as good as the statistics upon which it is based. The limitations of program costs and incidence rates of handicapped conditions already discussed should be kept in mind. Better cost and finance estimates cannot be produced without research.

6.0. COST-EFFECTIVENESS IN EDUCATION

The 1970's has witnessed the application of management science to the public sector. Though most studies have qualified their findings because of the difficulty to quantify the so-called "psychic benefits", they have demonstrated the applicability of a system's approach to both private and public organizations.

A comparison of human service organizations and business or private organizations was helpful in explaining the difficulties of performing cost-effectiveness studies in education (Table 26).

Low clarity of ultimate goals in human service organizations makes measurement of cost-effectiveness difficult, whereas business usually has a clear statement of goals and easily lends itself to cost-effectiveness measures. Another important difference is staff reliance on professional values in human services as the criteria for success (instead of profit and efficiency) and a focus on processes and means (instead of goals and ends). The orientation of staff roles in human services appears to be in conflict with the requirements for cost effectiveness. Whatever attempts be made to increase cost-effectiveness in education, they would have limited impact unless staff role changes also were brought about.

Despite the inherent difficulties of making cost-effectiveness studies in human services, governments have been turning to them as a source of

TABLE 26: COMPARING ORGANIZATIONAL CHARACTERISTICS OF BUSINESS & HUMAN SERVICES ORGANIZATIONS

	CHARACTERISTIC OR ISSUE	PRODUCTION ORGANIZATIONS	HUMAN SERVICE ORGANIZATIONS
1.	Principal Sector	Private	Public
2.	Input	Raw material	People in need
3.	Input uniformity	Optional	Heterogeneous
4.	Clarity of goals, end product	Usually high	Usually low
5.	Ideology	Materialistic, low	Ephemeral, high
6.	Typical orientation	Goals & Ends	Processes & Means; adherence to professional values
7.	Primary beneficiaries	Owners	Clients; often staff
8.	Secondary beneficiaries	Consuming public	Staff; sometimes clients
9.	Indices of adaptive change	Profit & Loss	Few
10.	Cost-effectiveness	Easily measured	Difficult to measure
11.	Success criteria based on	Profit & Efficiency	Professional values
12.	Potential for risk & loss	High	Low
13.	Type of power, control	Utilitarian; total control over processes	Normative; very limited control; much power-sharing
14.	Freedom	May get out of business	May be mandated to serve, perhaps even all comers
15.	Bases of social interaction	Organizational tasks	Professional sub-groupings
16.	Member's loyalty to organization	Assumed	Problematic
17.	Use of job tenure	Rare	Widespread
18.	Involvement in politics seen as	Legitimate	Illegitimate

(Adapted from: Harshbarger, 1973 by Wolfensberger, 1978) guidance. With the increasing need to optimize allocation of scarce resources, several management science techniques have been enlisted, notably Program Planning and Budgeting (PPB). An example of the application of PPB to special education may be found in Appendix MA, and other systems applications including modelling in Appendix MG . Often overlooked are the serious gaps in knowledge for which the budgeting technique must make judgments (e.g., incidence of handicapped conditions). A long-term research program specifically geared to solving these lacunae would improve the quality of the cost-related studies. Instead of having a proliferation of social studies dealing with ad hoc problems, the systems approach provides a plan for social research by showing the particular kinds of problems that need to be solved in order to attain a rational allocation of resources to the missions of the system (Churchman, 1968). The following presentation has outlined a number of areas which must be considered and researched to increase cost-effectiveness in education.

6.1. Educational Goals and Cost-Effectiveness

The performance of the system is judged by how well the overall objectives are met. However, objectives are relative to the decision-maker. Typically the manager of a system qualifies as decision-maker since he theoretically manages or manipulates the components of the system. From a broader perspective, the consumer can be thought of as the decision-maker because he provides the base in terms of which the decision-making ought to occur in the proper design of the system. This is particularly true of public systems which are by and for the people in the democratic sense.

In public education, the consumers are the children (and adolescents) typically between the ages of 5 and 19 years of age. Severely handicapped children have yet to be recognized as legitimate consumers but we shall assume so for the purpose of this discussion. Educators and educational administrators (including government) would have no difficulty in listing ultimate objectives such as preparing the children to participate in adult society, developing their judgement and skills, preparing them for employment and active citizenship to the greatest extent possible. Further questioning would reveal that the objectives above never or rarely are subject to attainment evaluation. Pupil progress pertains only to components or input of the system such as curriculum. Failure to evaluate the educational system by the overall system objectives has important consequences for cost studies. Whereas cost is measured in terms of input, quality or benefits are measured in terms of output. Until educational objectives are clearly described and taken as the starting point, cost-effectiveness studies will remain of limited use.

With the possible inclusion of severely handicapped children into the public schools of British Columbia, an urgent need exists to clearly specify educational goals for them. Once the goals are known, resource configurations which will support these goals can be studied. For example, if one goal is to integrate these persons into the mainstream of society, integrated programs become preferred over self-contained programs even if somewhat more expensive, because they contribute more to the attainment of the ultimate goal. A variety of integrated programs could be elaborated and studied for their feasibility and contribution to the several long-term goals.

6.2 Special Education Programs and Cost-Effectiveness

In addition to program characteristics which are dictated by the ultimate educational goals, effective utilization of program components can be explored on its own. Because instructional staff contribute the most to special education program costs, a focus on their utilization would yield the greatest returns. Section 3.7 reviewed the various pupil-teacher ratios which were recommended or practiced in special programs. Two variables were identified: intensity of program and use of teachers' aides. Intensity of program can be achieved by either decreasing the pupil-teacher ratio or adding a teachers' aide. Since the aide's salary is substantially inferior to the teacher's, we can expect that adding a teachers' aide would be the less costly option. However, only applied research can give a definitive answer. Similarly, a given intensity of program can be maintained with an increased pupil-teacher ratio if an aide is made available. Another possible utilization of aides would be several aides for one teacher to achieve an intense program. The effectiveness of these various options would have to be researched to guarantee optimum utilisation of staff.

Programs for low trainable retarded pupils likely would require more support staff to deal with matters beyond the school program such as parent training and coordination of social services (Appendix LA). How best to utilize these support staff has yet to be explored.

6.3 The School District and Cost-Effectiveness

6.3.1 External Factors. The performance of a school district is subject to a number of external factors which act as constraints. Marinelli (Appendix MA) identified the following factors: demographic, social, legal, economic and political. He argued that these external factors in concert with factors internal to the educational system control the student population and needs of special education, the amount of funds made available to special education and the manner in which those funds are allocated and expended.

The demographic factor particularly involves economy of scale. We can assume that the pupil population, and within it groups of pupils with different educational needs, must be large enough to reach the recommended pupil-teacher ratios in all or most classes. Similarly, a large pupil population permits rationalization of support services such as administration and transportation. However there exists a point beyond which increasing the population size diminishes savings due to unmanagability. Wolfensberger (1978) has suggested that a human services organization ought to have the following characteristics (among others) to support comprehensive services in an economical manner:

(1) The population base lies somewhere between 200,000 and 500,000, and preferably towards the 200,000 range;

(2) The geographic area must be small enough and/or have advantageous transportation routes to minimize transportation time; and

(3) A sufficient tax base must exist to fund a variety of relatively expensive programs.

A population of 200,000 may represent a school-age population of 50,000.[6] Thus a low incidence handicapped condition such as Low Trainable Mentally Retarded (0.04%) would mean a total of 20 pupils with similar educational needs placed in four classrooms distributed throughout the district to minimize transportation time and maximize accessibility.

Smaller school districts may achieve greater cost-effectiveness through regionalization of the special education system or parts thereof along with its support services such as transportation. Rossmiller (Appendix RD) noted this practice for low incidence groups such as blind pupils. An example of a regional transportation system may be found in Appendix BB.

A school district with a large geographic area and a small population may not benefit from regionalization. Under such circumstances, comprehensive services would be prohibitively expensive. Parents of children with low incidence severe handicaps may have to choose between remaining in their district and obtaining non-specialized services (or minimal specialized services) and moving in or near an urban centre where appropriate specialized services are available.

A few studies relevant to economy of scale have focussed on the educational system. Chalfant (1967) studied a number of factors which affected the presence of special education services in the counties of Illinois. Urbanization was found to be the most important factor; regardless of other factors, if counties were sufficiently urban, special services were provided without exception. A study of 19 Idaho school districts (Appendix SA) attempted to relate district size to costs. However, most districts had fewer than 10,000 pupils and no clear relationship between district size and costs was discernable. It was noted that fewer special education program categories were present in the smaller districts.

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[6] In 1976, persons of 5 to 19 years of age represented 27.4% of the total population of Canada and 26.7% of British Columbia (1976 Census of Canada). For the same year, persons of 5 to 17 years of age composed 23.2% of the population of United States.

The present author analysed data on 20 school districts in Massachusetts (see Comment to Appendix MD). District sizes ranged from 338 to 29,000 FTE pupils with Boston as the exception with 84,676. An Economy Statistic was defined as the percentage (%) of total instructional costs accounted for by 1% of special pupils (where 1% was in reference to the total pupil population). The data did not permit unequivocal conclusions because of the many uncontrolled variables such as severity of handicapped conditions. However, consistently lower values of the Economy Statistic were found for school districts with total enrollments of 15,000 or more. With this meagre data base, it was concluded that substantial economy-of-scale benefits can be expected for school districts with an enrollment of 15,000 FTE pupils or more, and greater certainty of benefits with an enrollment of about 50,000 FTE pupils.

Applying these standards to the Rossmiller NEFP Study, 13 out of 19 school districts had enrollments smaller than 40,000, and 8 of these 13 districts were below 15,000 (Table RD 35). It would appear that diseconomies of scale were present in his sample. In support of this conclusion, Rossmiller mentioned cases of diseconomy of scale a number of times.

The legal and political factors are evident in relation to the funding formula by which a state or province funds part of the educational costs incurred by school districts. Much debate has taken place over the different funding formulas and their effects (Appendices BC and MA). Though an analysis of funding formulas was not entertained, they undoubtedly bias a school district in its pursuit of cost-effectiveness, either positively or negatively. School districts would tend to offer programs and types of program delivery systems which are adequately and easily funded. The greater the district's wealth, the less constrained it is by the funding formula, and vice-versa for poor districts. A government that wishes to encourage cost-effectiveness in school districts would do well to thoroughly analyse its educational goals and choose a funding formula whose intended and non-intended effects support district cost-effectiveness for the entire range of district sizes.

6.3.2 Internal Factors. If a school district is to serve all or most children in its jurisdiction, comprehensiveness of services must be its objective. Several different kinds of programs must be offered, and programs must interrelate so that continuity of services is assured throughout the child's educational training. For a severely handicapped pupil, services would start at the pre-school level (0-4 years of age) with identification, and diagnosis as early as possible followed by remedial and developmental services. Parent-training would assure that child-training was supported and continued throughout the day. Interface with other human services (e.g., medical, social) may be required. Special transportation and a variety of other support services would be available at all times. The educational period may have to be extended beyond the 19th year of age up to 25 to complete the handicapped student's basic education and prepare him or her for work through vocational training.

Considerable efforts are required to effectively coordinate comprehensive services. Management control may be supported through an information system specifically geared to assist in decision making. A good working example may be found in Appendix CB. Model building with computer services would help in organizing the complex issues involved in running the system (Appendix MC). Program cost accounting would be an integral part of the information system to assist the rational allocation of resources, and would be congruent with cost control to minimize duplication of effort.

Few if any school districts match the above description of a comprehensive educational system. Only certain school districts may attain comprehensiveness and optimal cost-effectiveness, due to external factors. However, all school districts can attempt to assure continuity and breath of services and thereby increase overall cost-effectiveness.

7.0 RECOMMENDATIONS

The cost of educating mentally retarded children in public schools depends upon the number of mentally retarded pupils in each category of special educational need, and the cost per pupil of providing educational services to meet each of these needs. This study has attempted to reach best estimates for these quantities from the most reliable information available. This approach was taken in the absence of actual data for incidence of mentally retarded pupils in British Columbia, and in the absence of a comprehensive survey of costs for many educational categories, particularly for low trainable pupils.

Although the figures provided by the study must be tentative until relevant data can be collected, the study has established a systematic approach to analysis of the cost of educating mentally retarded children using widely accepted cost indices.

Based on the data collected and analysed, and presented in Sections 2 to 6, the following recommendations are put forward to assist in long-term planning of public education services for handicapped persons, in particular, for mentally retarded persons.

Recommendation A

It is recommended that the special education program categories and associated per FTE pupil cost indices, and incidence rates of handicapped conditions given in Table 27 be adopted as a framework for planning of public education services.

Recommendation B

It is strongly recommended that on-going research in special education be initiated, to include program categories, cost indices, incidence rates of handicapped conditions, intensity of handicapped condition, program delivery systems, and others, with the enunciated goal of cost-effectiveness.

TABLE 27: Recommended Special Education Program Categories, Cost Indices and Incidence Rates of Handicapped Conditions

Program Category	Cost Index	Incidence Rate of Corresponding Handicapped Condition [a]
Educable Mentally Retarded	1.87	1.62%
High Trainable Mentally Retarded	2.10	0.30%
Low Trainable Mentally Retarded	4.00	0.04%
Auditorily Handicapped	2.99	0.34%
Visually Handicapped	2.97	0.08%
Physically Handicapped	3.64	3.55%
Speech Handicapped	1.18	0.36%
Special Learning Disorders	2.16	1.06%
Emotionally Disturbed	2.83	2.00%

[a] 0.03% representing multiple handicapped persons other than low trainable mentally retarded persons must be partitioned to other single handicapped conditions because no special program category for them is recommended.

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EDUCATIONAL PROGRAM COSTS FOR MENTALLY RETARDED CHILDREN IN PUBLIC SCHOOLS

R.J. LeBrasseur, M.A.
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VOLUME 2
APPENDICES

This study was contracted by Woodlands/Community Educational Services Project.

FORWARD

The purpose of these appendices was multiple. Firstly, the immediate goal was to present cost and cost-related information which would be useful in developing cost guidelines for the public education of retarded children in the Province of British Columbia. Secondly, because the nature of educational costs can be understood only through addressing the total educational finance matrix (including all participants and all processes), information was included which documents this complexity and which may act as data base for future in-depth cost studies. Ample extracts were taken from Bernstein et al (1976) and Marinelli (1976) because of their comprehensive treatment of educational finance, and from Rossmiller et al (1970) for their seminal research of special education costs. Thirdly, given the conviction of this author that a systems approach to management of the educational finance matrix offers the best opportunity for rationality and improvement, some information on the systems approach was included as examples.

The format of the appendices is more or less standardized. Each appendix is coded by a double letter, with the first letter taken from the author's name and the second letter representing the alphabetical rank of appendices with the same first letter.

e.g. MA: Author is Marinelli (M)
: First within the Ms (A)
MB: Author is Mass. Dept. of Ed. (M)
: Second within the Ms (B)

Figures and tables are assigned the appendix code with a number added indicating the position of presentation within that appendix. No distinction is made between figures and tables.

e.g. Table MA1 } Presented in Appendix MA
Figure MA2 } where MA1 comes first
Table MA3 } MA2 second, and so on.

Within each appendix, the tables and figures usually retain the coding used originally with the new code added in brackets (e.g., Figure 5 (MA2)). The listing of appendices identifies the author, title, year of publication; if only the abstract was available, the word "Abstract" is attached in brackets.

Each appendix of a reviewed document begins with Author, Title, Publisher/Journal, Year of Publication, No. of pages, and where applicable, the ERIC document number[1]. A brief summary is presented followed by extracts from the original document which are thought to be of particular interest. A critical comment usually may be found at the end of the appendix and may include data summaries and analyses.

Whenever possible, the summary, tables and figures were taken unaltered from the original document. However, if the original summary was insubstantial, an improved version was written. Similarly, if the original tables and figures were lacking, improvements were made, usually as footnotes and additions. Sometimes costs were presented only in the body; consequently a summarizing table was constructed and substituted.

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[1] Educational Resources Information Center (ERIC) The documents with the ERIC no. given may be ordered from: ERIC
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APPENDIX AA

AUTHOR:	AISD Developmental Center Austin Independent School District Texas 78752
TITLE:	AISD Developmental Center
PUBLISHER/JOURNAL:	Same as Author
YEAR:	1977

SUMMARY

A folder of materials containing a slide presentation script in narration form, sample forms, and cost information were obtained through correspondence.

The Developmental Center was considered a pilot program operating on a "zero reject" model and demonstrating the practical feasibility of training severely and profoundly multi-handicapped children (3 - 21 yrs of age) in a pupil school setting. Seventy (70) to eighty (80) pupils were served in a building which was previously an elementary school.

The overall pupil goal was to develop his abilities to the fullest extent possible and at the same time provide remediation for his disabilities. Individualized programming for each child took place in five (5) skill areas:visual-perceptual, auditory-perceptual, perceptual-motor, communication, and functional living.A multi-disciplinary team composed of teachers, teachers' aides, speech therapist, psychologist, occupational and physical therapists, consultants, etc., assumed responsibility for training based on an operant learning model.

Parental involvement in a home training program is considered an essential part of the Center's program. In addition to involvement with the parent, the Center has found it necessary to actively

cooperate with a large number of agencies outside the public school system in order to program effectively for the children at the Center. These agencies included public and private health care agencies, public welfare agencies, agencies which provide rehabilitation services and other social service agencies.

During the 1974-75 school year, records were kept continuously on each child for 12 months. The children were given pre-and post-tests using the Pre-School Attainment Record. Children showed a mean growth of 8.2 months during this 12-month period, with 26% achieving 13 months or more. This amounted to about 2/3 of normal progress where previsouly developmental progress had been about 1/3 normal. There was also a high correlation between the number of days attended and achievement. These findings indicated that the Center's program was making a significant difference in the developmental growth of the children.

Costs per month including transportation and lunch were as follows for 1975-76:

(1)	severe and profound multi-handicapped pupil	$521.80
(2)	higher level special education pupil	$340.00
(3)	normal pupil	$129.30

Pupil-teacher ratios varied from 1 to 1 and 2 to 1 with the pupils joining larger groups at higher levels of instruction with approximately 6.6 pupils per teacher and 4.4 pupils per teachers' aide.

COMMENT

Though the Center operated within the community, it did so at a low level of integration. That is, the Center was housed in a separate building with apparantly little contact with regular schools. The extent to which integration should take place at the lowest levels of programming is a moot point.

Little detail accompanied the cost figures given. It would appear that the program was run on a twelve (12) months basis. Criticism aside, cost indices were calculated and presented below:

TABLE AA : Costs and Cost Indices for programs of the Developmental Center in Austin, Independent School District, 1975-76

PUPIL CATEGORY	COST PER MONTH	COST INDEX
Severe and profound multi-handicapped	$521.80	4.04
Higher level	$340.00	2.63
Normal	$129.30	

N.B. Includes direct and indirect costs, in particular, transportation and lunch.

APPENDIX BA

Bentley, R.W. An exploration of relationships between expenditures for educational programs for exceptional children and expenditures for regular education programs. Doctoral dissertation, University of Wisconsin, 1970. (Ann Arbor, MI: University Microfilms No. 71-3449).

Bentley used data from the NEFP Special Study No. 2 (Rossmiller et al., 1970) to compare a variety of cost components of special and regular education. His sample was composed of 16 school districts reputed to have outstanding programs and included a wide geographical distribution (California, Florida, New York, Texas, and Wisconsin). The author acknowledges his sample was not representative of all special education programs, but instead encompassed what might be considered a representative sample of exemplary or "best practices" cases. In response to four basic and three ancillary questions, Bentley concluded:

1. Eight cost factors are responsible for the differences in cost between special and regular educational programs.
2. The cost factors vary greatly between districts and programs.
3. Except for programs for the mentally retarded, there was no stable ratio of expenditures for regular and exceptional programs between districts providing high-cost regular programs and districts providing low-cost regular programs.
4. There is reason to believe the type of state support (categorical or general) is correlated to per pupil expenditures and cost differentials.
5. There was some consistency in cost factors from one program to another, particularly in the costs of teachers, supportive services, and supplies and equipment.
6. Although there is some consistency in cost factor ranking between special and regular education programs, it is not sufficient to aid planning efforts.
7. The extremes of expenditure levels on special programs precludes making valid comparisons between districts.

Comment

Bentley's study does move toward the substitution of program costs for general functional costs in financial analyses. However, no distinctions are made between the types of programs offered and the degrees of handicapping served, which may account for the wide variation both within and between districts. Without a consistent unit of measurement related to outputs, an analysis of per pupil costs must entail only rough estimates; therefore, cost comparisons using these estimates will remain inconclusive.

(Above taken from Bernstein et. al. (1976))

APPENDIX BB

Author: Bayliss, Edward T.

Title: Cost analysis for regional transportation system.

Publisher/Journal: Concord Research Corp.,
74 Loomis Street,
Bedford, Massachusetts 01730

Date: 1974

No. of pages: 31

Eric No. ED 098 693

SUMMARY

The Education Cooperative (TEC) composed of nine contiguous Massachusetts towns (Dedham, Natick, Needham, Norwood, Walpole, Wayland, Wellesley, Weston, and Westwood) is exploring the possible development of a regional transportation system to serve the special education pupils within these communities. This report describes the planning required and evaluates the potential savings of such a system. The objective of the study was to develop a model for sharing the transportation of the special education children of the nine contiguous TEC towns. Some of the general subobjectives are: to demonstrate a savings in the operation of the transportation system, to improve service quality and consistency, and to centralize transportation administration to foster continued efficiency and control. Ancilliary objectives are to suggest legislation, to facilitate cooperative action among school districts, and to encourage other towns to join in undertaking cooperative enterprises. The report describes the development of a centralized office to coordinate transportation activities and to handle the data needs of those activities, presents costs analyses of the current transportation operation and of the projected regional transportation system, and presents some cost comparisons and recommendations for further action. (Author/DN)

The following were extracted for the purpose at hand.

4.1 Development of Transportation Guidelines

In any cooperative venture one may find different standards of service from town to town, different understandings of cost requirements, and different determinations of the transportation needs of children. It is therefore important to come together at the start to reach a common agreement on a set of guidelines that can be uniformly applied in transporting pupils from all of the member towns of a regional transportation system. Ideally, it would be well to have a meeting of the Special Education Administrators for each town, together with transportation representatives, to draft a comprehensive set of guidelines that could be applied throughout the regional transportation system.

The following is a list of some examples of areas that should be considered in setting up guidelines. In most cases there is a great deal of subjectivity that must be applied by the Special Education Administrators and the Transportation Coordinator in defining any set of guidelines to apply to individual children.

4.1.1 Compatability - As an example, it is possible that certain types of children with emotional problems could be adversely affected by being transported with children who are mentally retarded or physically handicapped. It may be desirable to provide separate transportation for children with these types of handicaps. Furthermore, it is possible that more than 5 children with behavioral problems would be over the limit a driver could safely handle in the process of transporting them. It is therefore possible that the permissible vehicle limit would be lowered for certain types of children.

4.1.2 Load Limit - As illustrated above, there may be practical limitations to the load a vehicle can carry, aside from the limit of the number of children that can be safely controlled. A practical limit usually results from the imposition of time or mileage limits. In addition, the type of vehicle generally used for this type of transportation (usually a nine-passenger wagon) places an upper limit on the number of pupils that can be transported together. With an average load time of approximately 3 minutes per child, it is not hard to see that the number of children per vehicle will be kept low if a time limit is imposed.

4.1.3 Travel Time Limit - Should a travel time restriction be imposed? The Division of Special Education has established a one hour maximum riding time. There are exceptions to this, where route length is substantially longer due to distant school assignment. These types of considerations make the choice of a school closer to the pupils' homes desirable. These considerations have a direct economic impact. Shortening the routes unduly will lessen the load factor, thereby increasing the overall cost. A goal of 45 minutes average travel time, with an upper limit of 60 minutes, seems to be a reasonable compromise between service and economy.

4.1.4 School Opening Time - It is often possible to combine children destined for more than one school on the same route, providing those schools are relatively close to one another. In these situations it is very desirable to have school opening times adjusted so that they are close but not exactly the same. This makes multi-community and multi-school transportation much more attractive and easier to accomplish. Such a change would require the cooperation of the receiving schools, if adjustments in their opening times were to be required. This, of course, is not to suggest that the transportation requirement should dictate programmatic requirements for special education programs. However, it is well to keep in mind that any improvement on transportation which results in dollar savings, can often result in increased dollars being available for programs.

4.1.5 Transportation Needs - It is necessary to classify the children as to their transportation needs. The classification of children by their transportation needs is not quite the same as classifying them by their type of special handicap. For example, the term physically handicapped is a clear definition of a type of handicap. However, this is not clear enough for transportation purposes. A child may have braces and walk with crutches. Or, a child may be confined to a wheelchair. The need is not to know whether he has Cerebral Palsy, Muscular Dystrophy, or a neurological disorder, but to know what type of transportation requirement his particular condition requires (e.g., a taxi could easily transport 5 children with crutches, but could not safely transport 5 children with wheelchairs).

For transportation purposes, it is sufficient to classify children in general groups with regard to their handicaps. The following seven categories should suffice for general transportation classification;

Hearing Impairment - deaf, hard of hearing, etc.
Visual Handicap - blind, low vision, etc.
Emotional Handicap - emotionally disturbed, autistic, other behavioral problems
Mental Retardation
Language Handicap - speech impairment, bi-linguality, etc.
Physical Handicap - Cerebral Palsy, Muscular Dystrophy, neurological disorder, other motor disorders
Learning Disability - aphasia, dyslexia, other perceptual disorders

These classifications will suffice to describe the general handicap area. What is more important is how the handicap affects the transportation requirements of each individual child. In the majority of cases there will be no restrictions imposed by the handicap. The following sampling will illustrate the type of sub-classification that is desired in order to determine transportation requirements:

Lift into and out of vehicle.
Transport in a wheelchair.
Wheelchair transported with child.
Requires special attention due to young age.
Requires special attention due to medication.
Liable to have seizures and must be closely watched.
Becomes ill, upset, or unruly if ride is too long.
Requires attendance of an adult during transportation.
Behavior problem and should be transported alone or with an attendant.

In summary, there are a multitude of details which must be attended to in order to design satisfactory transportation guidelines for children with special needs. In a cooperative situation it is even more critical to define these standards and have them accepted by the member school systems, so that no child will receive improper transportation because the information on his needs was misunderstood or ill-defined. When these guidelines are defined and adopted by the TEC communities, both the Regional Transportation Coordinator and the Special Education Administrators of the communities will be in a much better position to apply the guidelines consistently to the the transportation requirements of each child.

It would be well to review the results of the project to improve the Special Education Transportation System for the Massachusetts Department of Education[2] (Table 3). The results show that an overall cost reduction of 32% was achieved by redesigning the routes and preparing comprehensive data packages which specified each route in detail. This detailed bid specification, together with stimulated competitive bidding, achieved the results shown. What is even more remarkable is that the redesigned routes showed a decreased load factor and route length, indicating an improved service factor was simultaneously achieved. These results are included to show that not only can cost savings be made, but substantial improvement in effective transportation service can be achieved at the same time, though a comprehensive program to centralize transportation, redesign routes, and stimulate competitive bidding.

Several general comments can be made with regard to grouping children and thus obtaining cost savings for the regional transportation system that are not available to the individual school system. Grouping children allowed us to pick up children from two or more towns in most cases. Approximately 75% of the routes have children grouped either by towns or by their schools. The average number of pupils per vehicle works out to be 4.78 pupils, which is two more children per route than is currently the case. The average route length works out to be 26.6 miles, and the average time is 45.8 minutes (See Table 4).

The cost savings are a result of three major steps. Efficient route optimization and redesign allows for improvement in overall cost effectiveness. Stimulation of open competitive bidding results in more competitive prices. The centralized control through the Regional Transportation Coordinator enables the efficiencies obtained in the first two cases to be maintained throughout the school year.

There are additional benefits to the school districts, over and above the aforementioned cost savings. Local administrators are relieved of most of the burden of arranging and continually revising transportation for these children. The service the children receive is improved, and is more uniform. And, by reducing the cost of transportation, budget appropriations are proportionately reduced.

TABLE 3 (BB 1)

SUMMARY OF RESULTS

A PROJECT TO IMPROVE THE SPECIAL EDUCATION TRANSPORTATION SYSTEM FOR THE MASSACHUSETTS DEPARTMENT OF EDUCATION

	1972-73 STATISTICS BEFORE ROUTE REDESIGN	1973-74 STATISTICS AFTER ROUTE REDESIGN AND COMPETITIVE BIDDING	CHANGE
COST RESULTS			
TOTAL PROJECTED CONTRACT TRANSPORTATION COST	$3,076,890	$1,838,229	-40%
TOTAL NUMBER OF ROUTES	385	467	+21%
COST PER ROUTE	$7,992	$3,936	-51%
TOTAL PUPILS TRANSPORTED	1,870	1,651	-11%
AVERAGE YEARLY TRANSPORTATION COST PER PUPIL	$1,645	$1,113	-32%
SERVICE RESULTS			
AVERAGE PUPIL LOAD PER VEHICLE	5.5	3.5	-34%
AVERAGE ROUTE RUN TIME - MINUTES	77	55	-29%
AVERAGE ROUTE LENGTH - MILES	39	27	-31%

TABLE 1 (BB 2)

SUMMARY OF COST DATA OF PRESENT SYSTEM

	DESCRIPTION		DEDHAM	NATICK	NEEDHAM	NORWOOD	WALPOLE	WAYLAND	WELLESLEY	WESTON	WESTWOOD	TEC TOTAL
1.	# of Pupils w/ Cost Data	#	44	37	28	25	21	37	33	35	18	278
2.	Daily Cost Total	$	204.74	240.25	161.43	155.49	182.99	258.49	207.40	212.94	192.00	1815.73
3.	Average Daily Cost/Pupil	$	4.65	6.49	5.77	6.22	8.79	6.99	6.28	6.08	10.67	6.53
4.	Total TEC Kids (new)	#	47	37	28	34	21	45	37	38	18	305**
5.	Approximate Total of Rts.	#	14	15	15	15	11	23	11	15	12	131*
6.	Adjusted Daily Cost Total	$	218.79	240.25	161.43	211.48	182.99	314.55	232.36	258.40	192.00	1992.08
7.	Adjusted Annual Cost Total (180 days)	$	39366.	43245.	29057.	38066.	32938.	56619.	41824.	46512.	34560.	358574.00
8.	Adjusted Annual Average Per Pupil Cost	$	837.57	1168.78	1037.76	1119.60	1568.49	1258.20	1130.40	1224.00	1920.00	1175.65
9.	Adjusted Annual Average Cost Per Route	$	2811.86	2883.00	1937.16	2537.76	2994.38	2461.70	3802 25	3100.80	2880.00	2737.21
10.	# of Carriers	#	1	1	2	3*	3	3	1	1*	3	13*

**Actual Figures

* Estimated Figures

Table 4 (BB 3)

COST COMPARISON FOR PROPOSED REGIONAL TRANSPORTATION SYSTEM

	PRESENT SYSTEM	PROJECTED REGIONAL SYSTEM	CHANGE	STATE TRANSPORTATION SYSTEM
Total Projected Contract Transportation Cost	$358,574	$273,219	-$85,354	
Average Yearly Transportation Cost Per Pupil	$1175.65	$ 895.80	- 24%	$1113.00
Average Daily Cost Per Pupil	$6.53	$4.98		$6.18
Total Pupils Transported	305	305	--	1,651
Total Number of Routes	131	58	- 56%	467
Average Annual Cost Per Route	$2737.21	$4694.90	+ 71%	$3936.25
Average Cost Per Mile	1.19*	0.90	- 24%	0.89

---

*Based on routes surveyed.

COMMENT

This study may be taken as an example of system's planning as related to transportation. Appropriate accent was placed on the need for thorough early planning, setting of guidelines cooperatively among the Regional Transportation Coordinator and the district special education administrators, and centralized authority embodied in the Regional Transportation Coordinator.

The focus of the study was too particularistic in that it failed to address the possibilities of transportation of some special pupils with regular pupils and use of alternative vehicles. The general context of transportation system was not explored, nor were certain particular aspects of transportation such as transport during school hours. Additional lack of details were admitted; the author stated that the projected routes were meant "to demonstrate the feasibility and evaluate the cost effectiveness of a proposed regional transportation system. When detailed routes are designed, far more consideration will have to go into their design than was included here".

The yearly cost savings of $85,354.00 reported in Table 4 would have to be balanced against new costs such as the salaries of the Regional Transportation Coordinator and support staff (i.e.secretary-clerk), and related costs. Assuming these additional costs amounted to $30,000.00 per year, net savings would be reduced to $55,354.00. The proposed transportation system would reduce costs by 15% instead of 24%, that is, an average daily per pupil cost of $5.53 instead of the reported $4.98.

APPENDIX BC

Author: Bernstein, Charles D., Kirst, Michael W., Hartman, William T., and Marshall, Rudolph S.

Title: Financing educational services for the handicapped. An analysis of current research and practices.

Publisher/Journal: Council for Exceptional Children, 1920 Association Drive Reston, Virginia, 22091.

Year: 1976

No of pages: 79

SUMMARY

This report reviewed and evaluated the existing literature and current state practices in the field of special education finance. The ultimate purpose was to assist educational policy makers at the state and federal levels.

In addition to a comprehensive literature search of all available published and unpublished materials, a survey was conducted to obtain information on current practices in financing special education programs and to collect any state finance studies that had been performed. This information was organized into four major areas: 1) program alternatives, 2) methods of determining individual program cost, 3) level of funding and the proportions contributed by different levels of government, and 4) funding formulas which specify the procedures for distributing state funds to local districts.

In addition, the report provided brief discussions of key issues that affect planning (e.g.'s categorical vs noncategorical funding, mainstreaming), and a list of decision criteria to aid in the assessment of present or proposed special education delivery systems. Abstracts of all major documents with critical comments were presented in a separate section.

The following details were extracted for the purpose at hand.

PROGRAMING

The most common organizational scheme appearing in the literature is that proposed by Reynolds (1962). Both the type and severity of handicapping conditions are implicit in the hierarchical arrangement of the following nine program alternatives:

1. Regular classroom with consultation to the regular teacher.
2. Regular classroom supplemented by an itinerant teacher.
3. Regular classroom supplemented by a resource teacher.
4. Part time special class
5. Full time special class.
6. Special day school.
7. Homebound instruction.
8. Residential school.
9. Hospital school.

As one proceeds down the list of alternatives, the following tendencies may be observed:

- the programs are designed to meet increasingly complex educational needs.
- the demand for additional and more specialized personnel increases.
- programs become more expensive as a result of higher personnel costs.

To be adequate and appropriate, programs must be related to their specific recipients; yet no standard definition of the target population has been established. Estimates of incidence rates of handicapped persons range from 7.39% to 35.05% with 9-10% as widely used rates. A related problem is that a satisfactory means of diagnosing and remedying educational deficiencies has not been generally accepted. Many states are now providing for assessment teams that will advise placement on the basis of expert opinion.

The difference between program alternatives are often identified by comparing cost data, although such cost variations are only superficial manifestations of much more important considerations. Because costs are the most quantifiable attribute of a program, they have served as surrogates for more valid concepts of appropriateness or effectiveness, or both. The problem is that other empirically based data on which to base program preferences do not exist.

More differentiation of program alternatives according to specific characteristics would permit more accurate projection of costs of program changes. To demonstrate by examples, Tables 1 and 2 display information by severity of handicap and by program alternatives which would permit more accurate cost projections than if only average cost by type of handicap was available. Similarly a comparison of average expenditures per student among districts in the state is not meaningful unless the program alternatives are specified.

Table 1. Cost Variance by Handicap and Severity.
(BC 1)

		TYPE OF HANDICAP		
		A	B	C
Severity	Mild	$300		
	Moderate	$500		
	Severe	$700		
	Average cost	$500	$1,000	$1,500

N.B. Severity of handicap was defined by number of hours per week of services: mild - 2-4; moderate - 5-7; severe - 8-10.

Table 2. Cost Variance by Program Alternatives.
(BC 2)

	TYPE OF HANDICAP		
Program Alternatives	A	B	C
Itinerant teacher		$ 750	
Resource room		$1,000	
Special class		$1,200	
Average Cost	$500	$1,000	$1,500

In summary, it is not necessary that an individual district or state offer more than one program, but it is essential to recognize that every district or state providing services for handicapped students has chosen, whether explicitly or implicitly, these programs from an array of alternatives. Moreover, it is not necessary for a state to fund each program alternative separately. Costs for programs will vary as a function of the program alternative that best meets the needs of the individual handicapped child, and not a function of the handicapping condition alone. However, if funding is to reflect costs, the state's method of reinbursement to local districts must take into account the specific costs of the program alternatives.

Future research should be directed toward answering the following questions:

How many children require special education services to meet their educational needs?

What program alternatives are effective in meeting particular needs?

What proportion of children can be effectively served by each program alternative?

The adequacy and effectiveness of services cannot be ascertained without a well defined profile of the population to be served. Such a profile should delineate the functional definitions of educational handicapping conditions, as well as objective measures of the educational achievement of the children with these handicaps. If programs are to be compared, the population to be served and the program objectives must be comparable from the outset. Exogenous factors can never be entirely eliminated, but an effort must be made to establish common bases for discussion and analysis.

COST DETERMINATION

This section is included in its entirety. The underlining and paragraph brackets are the doings of the present author.

AT A TIME when widespread concern is being voiced regarding the inability of traditional funding sources to meet the increasing needs of public education, perhaps the most frequently asked question is, "How much is it going to cost?" The following discussion concentrates on the issue of program costs and how they are determined.

Costs represent a difficult problem for policy makers partly because of the various notions of *cost*. Depending on the context, planners may be interested in full costs, direct costs, marginal costs, approved or allowable costs, or any number of others. Another source of difficulty is the future orientation implied by the question, "How much is it going to cost?" Although it cannot always be taken for granted, past expenditure records are generally available as indicators. However, the past is only a rough guide to the future. In practice, the cost question is frequently rephrased in terms of policy as, "How much are you willing to spend?"

RESEARCH BASE

The major influence in educational finance in recent years has been the National Educational Finance Project (NEFP). Between 1968 and 1972, the NEFP conducted a national study of school finance under a grant to the Florida State Department of Education from the US Office of Education, Department of Health, Education, and Welfare. To fulfill their charge of determining the educational needs of the next decade, the researchers outlined a methodology for estimating future school populations and for computing present costs as a guide to future projections. It was felt the current costs of particular types of programs might be subject to special conditions that were a function of the time or place of measurement. As a result, a cost index was adopted. It is a ratio of the per pupil expenditure on special services—whether compensatory, preschool, vocational, adult, or exceptional programs—divided by the per pupil expenditure for a defined regular educational program. The index was assumed to be a more useful indicator of relative costs between programs, districts, and time periods than the raw expenditure data.

The NEFP literature consists of three types of documents: the principal volumes, which present the overviews, summaries, and findings of the entire project; the special studies, which concentrate on specific educational areas or issues; and the consulting studies initiated by individual states or public agencies who wished to apply NEFP expertise to specific tasks. Most of the publications deal with general issues in education, but special education is mentioned throughout many of the studies and is the subject of one special study.

The first volume (Johns, Alexander, & Rossmiller, 1969) outlines the dimensions of total educational need and includes a paper by Rossmiller that served as a prelude to a subsequent special study of special education finance. The McLure-Pence special study of early childhood and basic education also examined the financing of special education. *Planning to Finance Education* (Johns, Alexander, & Jordan, 1971) contains summaries of these and the other satellite studies, and *Alternative Programs for Financing Education* (Johns & Alexander, 1971) presents a consensus of findings and recommendations by the NEFP central committee.

The special NEFP study on programs for exceptional students (Rossmiller, Hale, & Frohreich, 1970) reports the results of a study of selected districts offering comprehensive, high quality special education programs in five states (Wisconsin, Florida, California, Texas, and New York). In accordance with NEFP methodology, expenditure data were gathered for both regular and special programs. In most cases, the districts had to reorganize their data in order to allocate expenditures to the various programs, because most districts accounted for expenditures by line-item (salaries, supervision, maintenance) rather than by program. Expenditures were also adjusted to account for part time summer programs or other atypical enrollments.

Wide variations in expenditures per pupil occurred within the different programs of a single district and among districts with similar programs. Rossmiller pointed out (personal communication, December 8, 1974) that most of the programs for which data were obtained in the NEFP's study were self contained classroom programs and the greatest variability in both organization and expenditure was found in the "newer" programs (new in the sense that programs were either new to the district where they were being offered or were being provided for a category of children only recently identified as handicapped). Despite the variability, an average composite index of slightly over 2 was computed when all special education programs were aggregated, indicating such programs were, on the average, twice as expensive as regular education programs. With these cost data and some assumed prevalence rates, the researchers established an estimate of need and projected it into the next decade. The study concludes with a brief summary of trends likely to affect special education in the future.

The NEFP undertook or contributed to a number of state studies: South Dakota (National Educational Finance Project, 1973c), Kentucky (National Educational Finance Project, 1973b), Delaware (Rossmiller & Moran, 1973), Texas (Busselle, 1973), Florida (National Educational Finance Project, 1973a), and Mississippi (Governor's School Finance Study Group, 1973). The findings of these studies were generally similar to earlier NEFP studies. Where substantial differences occurred, however, the recommendations followed the trends observed elsewhere rather than the state's own practices. As a result, the apparent consistency in the funding recommendations of the NEFP state studies is, to some extent, imposed by the researchers. This observation is disquieting in view of the wide variances observed within the individual studies and the significant fiscal impact of the conclusions.

Similar studies were conducted in Illinois (Sorensen, 1973) and Indiana (Jones & Wilkerson, 1972). Because not all states include some items, such as transportation and capital outlay, the results of the various studies are not strictly comparable. Nevertheless, the magnitude and direction of the results are usually consistent, an observation that may be due as much to a common methodology (formulas for allocating overhead and so forth) as to the accuracy of the findings. However, the variations in expenditures, even between similar programs, are so great any generalization must be treated with skepticism.

A number of doctoral dissertations were also inspired by the NEFP. Sorensen's Illinois study, for example, was first published as his thesis and later as a state document. Bentley (1970) and Nash (1971) performed statistical analyses of NEFP data to determine the influence of particular variables on the quality and the cost of programs. Clemmons (1974) used the same method of investigation as the NEFP, but also developed cost comparisons based on program alternatives. In addition to encountering the problems—to be discussed shortly—inherent in all NEFP-type studies, these dissertations employ a data base not always satisfactory for the kinds of statistical analyses performed. Any conclusions from such studies must be regarded as questionable, given the small sample sizes and the selective interpretation of particular data. In spite of the authors' expressions of caution with respect to unwarranted inferences, there is always the risk that uninformed persons will view correlational data as indicative of causal relationships or cost data as final determinations of need.

Bentley (1970) examined the NEFP cost factors in detail. Although his breakdown of program costs into their line-item components promised to provide significant data, there was virtually no consistency between high- and low-cost programs both within and among districts. However, some of the components—primarily instructional salaries, supportive services, and supplies and equipment—appeared to be consistent among all programs, although this consistency tends to explain cost similarities more than cost differences.

Nash (1971) constructed a systems analysis, input-output model to determine what inputs might contribute to differences between districts with programs experts had judged to be of either high or average quality. Important factors were found to be the number of programs, some curriculum characteristics, the level of teacher training, the size and wealth of districts, and a number of nonquantifiable inputs, such as leadership, parental participation, educational philosophy, and program comprehensiveness. Somewhat unexpectedly, the level of teacher experience was found to have a negative correlation to the quality of the districts' programs.

Clemmons (1974) developed cost indices for seven special education categories in a manner similar to that used in the 1970 NEFP special study. He also collected costs and calculated indices for the following six programing alternatives (delivery systems): regular classroom with consultant, regular classroom with itinerant teacher, regular classroom with resource room, part time special education classroom, self contained special education classroom, and homebound or hospitalized instruction. However, he cautions the reader against making inferences based on these indices because of the limited size of the sample.

The Airlie House Conference approach (Taylor, 1973) mentioned in the previous chapter employed expert opinion directly as a means of establishing incidence rates and program needs. Once student needs are properly assessed and resource configurations (including the pupil-teacher ratio) are established, costs are computed using either averages or the current market prices of resources. This method is based on a analytical structure that isolates individual cost components. As such, the method represents a step by step process for looking at the problem of cost determination. It is not tied to any particular data base. The modular structure of the approach permits users to substitute their own incidence rates, program alternatives, or price levels. In contrast, the NEFP approach aggregates all of these individual components.

The system advocated and partially delineated by the accounting firm of Ernst & Ernst represents a considerably different aspect of cost determination. Under a contract from the Bureau of Education for the Handicapped, the Ernst & Ernst group proposed an accounting system that would compute the excess costs of special education. However, it was first necessary to create a system that would track all the educational expenditures, both planned and actual, of a school district. The school day was broken down into 10 minute units called Ernst & Ernst Student Educational Units (EESEUs). For each program (English, mathematics, physical education) a unit was assigned a price determined by past experience. The curriculum, in turn, was composed of a specified number of each type of unit.

Any variance from the planned curriculum could be traced to a change in enrollment levels, a change in the program mix of the curriculum, a change in prices, or some combination of these factors. As with all accounting approaches, this system was intended to collect historical expenditure data. It was not designed to take cognizance of costs as they reflect needs. As such, the system is more a control or management tool than a planning aid.

For planning purposes, a cost accounting system would be particularly valuable when linked to evaluation techniques to produce cost-effectiveness data. Evaluative studies, however, generally relate the methods and resources employed to measures of the results achieved. The Ernst & Ernst model, for instance, measures the costs of educational output in terms of 10 minute units. Ideally, educational outputs should be measured in terms of units of learning, but such a system has yet to be developed. The problem of measuring output has continually frustrated attempts to conduct cost-effectiveness studies in regular as well as special education (Levin, 1974). The difficulties are perhaps more acute in special education where objectives range from behavior modification to skill acquisition to content retention. These limitations may explain why so few evaluative studies have been conducted in the area of special education.

Exotech (undated) examined Part B of the Education of the Handicapped Act (P.L. 91-230) to determine whether federal aid should be injected at the state or local level. Key indicators were used to compare grantees and nongrantees. Because of a lack of concepts of costs and effectiveness, only a few statistical analyses were possible. The difficulties were compounded by the fact that federal aid amounted to such a small portion of total district special education expenditures that this aid could scarcely be considered a "treatment" in any experimental design. Finally, the criteria used to select the grantees were not controlled and could have easily been confused with the effects of the grants.

The study's conclusion that federal aid at the state level does promote program development was supported by a second Exotech study (1973) of state institutions. However, the principal research instrument in this study was the open ended personal interview, and much of the analysis consisted of an interpretation of impressions. The authors were careful to avoid inferring causality from the statistical operations performed, yet this caveat has the effect of negating many of the findings.

Management Analysis Center, Inc., confronted the same problem in a cost-effectiveness study conducted for the state of Maryland (undated). Recognizing the methodological limitations inherent in the project, the researchers chose to collect a variety of types of information; various test scores, numerous activity measures, and case histories were all employed in the evaluation. Although the results were inconclusive from the standpoint of cost-effectiveness, a great deal of cost-efficiency data were collected which provided administrators with guidelines for program improvement. Furthermore, the study presents a comparison of the relative value and consistency of various evaluative indicators.

ANALYSIS

If state reimbursement to districts for special education is based on actual costs, the method of cost determination takes on more significance than it does when funding is tied to fixed indicators, as with grants computed on a per class, per teacher, or per pupil basis. In any case, state legislators and educators should be aware of the method of determining the costs of special education in their state. Although many states have attempted to match funding with costs, no satisfactory method for determining needs, and thus costs, has been developed. On the other hand, a number of states do not use actual costs as a direct basis for funding. A review of state documents indicates that funding needs are currently determined by empirical, judgmental, and political methods, or by some combination of these.

With the empirical method of cost determination, past expenditure levels are extrapolated into the future. It is assumed past expenditures approximate current needs, but this is not always the case. First, past expenditures may be the result of expenditure ceilings, political caprice, traditional funding patterns, or other exogenous factors rather than past needs. It is likely, for example, that if a particular service were to be arbitrarily funded at 10 times the funding of another service, it would eventually come to "cost" 10 times as much and could thereby be justified by empirical data. Second, even if past expenditures were tied to past needs, current needs may not be the same as those of the past. For instance, children with learning disabilities are emerging as an important group in special education, but states with no programs for these children would have no empirical data reflecting the need for such programs.

The NEFP researchers are specific about the limitations of their methodology and the tentativeness of their conclusions, although their caveats have been largely ignored by planners and legislators who have translated the state cost studies into fixed financing formulas. Rossmiller and Moran (1973), for example, cite the inadequacy of averages and the tendency to ignore interdistrict differences relating to size, cost of living, and other environmental factors as serious constraints to using the data for policy formulation. Because expenditure data are descriptive rather than normative, historical practices, rather than current needs, are documented. Furthermore, qualitative variables, such as efficacy or efficiency, are excluded from consideration.

The cost index—the critical unit of the NEFP analysis—must be employed with care, according to Rossmiller and Moran, since it may obscure important information. Only the numerator of the ratio reflects the cost of special education, so two indices may not be strictly comparable when different denominators are employed. Two districts, for example, with identical special education programs and costs may have different indices if the costs of their regular education programs differed, for whatever reason. Moreover, if special education remains more labor-intensive than general education as a result of an overall lower pupil-teacher ratio, inflation will tend to increase the cost of special education more rapidly than those of general education. Thus, these indices are not necessarily as stable over time as their use in legislation would seem to imply.

With specific reference to data collection in special education, Rossmiller and Moran point to the need to categorize programs by delivery alternatives, as well as by handicapping conditions. In the original NEFP studies, all types of delivery alternatives (itinerant teacher, special class, resource room) were aggregated, which helps explain some of the cost variations observed in these studies. The findings in Bentley's dissertation, for example, which attempted to isolate the effects of particular components, might well have been more consistent if the author had taken into account the different delivery alternatives, as Clemmons' dissertation proposed.

As Rossmiller and Moran point out, qualitative factors are not differentiated by the NEFP methodology. Nevertheless, some notion of quality was integrated into the data, although it could not be controlled in any scientific way. Experts were canvassed to arrive at a consensus judgment of high quality programs in states and districts. The sample was then selected with the goal of obtaining as representative a sample as possible according to geographical, environmental, and administrative criteria. The use of expert opinion in the sample selection presents no problem in the original special study, but it does present a problem, for instance, in Nash's attempt to isolate the determinants of quality. He subjected the data from high and average quality districts to an analysis that was ultimately tautological. In other words, since input factors may influence the judgment of quality, an examination of the input variables may reveal the evaluative criteria used by the experts; no independent determinant or causal agent of quality can be inferred.

The NEFP's implicit notion of quality contains an assumption which is never clearly expressed—the historical expenditures in "best practice" districts are directly related to the costs of special education services necessary to meet the educational needs of handicapped students. The difference between past expenditures and the costs of needed services is critical. Although expenditures may equal total needs, this is not typically the case. In most states, the expenditures by both state and local agencies do not cover the costs of providing full services to all those requiring them. An exception is Montana (Joint Committee on Education, 1973) where, for a number of years, expenditures for special education appeared to exceed actual costs because special education funds were used for regular programs. In short, expenditures reflect not only traditional practices, but all the fiscal limitations and political pressures in state policy making. It cannot be assumed that current expenditures, even in best practice districts, are either adequate or equitable. Recent litigation (Kirp & Yudof, 1974) strongly suggests that the current financing levels and formulas are seriously inadequate.

The NEFP methodology involves an accounting procedure applied to a historical data base. Past school accounting practices, however, were not designed to measure program costs, so the data underwent substantial manipulation before being transformed into a form suitable for the NEFP analyses. The researchers, for example, instructed participating districts to allocate many of the unattributed indirect costs on a per pupil basis. If the proportion of funds allocated in this way is minor, then it may be of little value to perform a time consuming, detailed cost study when knowledge of the pupil-teacher ratio and the average teacher's salary will provide equally reliable information. If the proportion is substantial, the per pupil allocation procedure will distort the index by reducing whatever indirect cost differences there are between programs. In any event, the reported results do not indicate the magnitude of indirect costs allocated arbitrarily, so there is no way to ascertain the impact of this particular procedure.

In one study that used a NEFP-type research design (Snell, 1973), the conclusions are significantly affected by the choice of a particular allocation procedure. Of the four programs studied—educable mentally retarded, trainable mentally retarded, speech and hearing, homebound—the last two were considered additions to the regular program. Consequently, the cost of the regular program was added to the costs of the special programs. The cost indices for the speech and hearing program ranged from a high of 1.30 to a low of 1.15 and were thus found to be both *stable* and *consistent*. However, the major cost component of the speech and hearing program (median = $694) was the regular program (median = $575), which accounts for most of the index's stability. If only the special program costs were compared, the high index of .30 (1.30 less the regular program) is twice that of the low index of .15 (1.15 less the regular program. From the standpoint of the planner or policy maker who is attempting to estimate the incremental costs of special education programs, the differential between .15 and .30 (or 1.15 and 1.30) is crucial, particularly for a high-incidence category such as speech and hearing.

A serious problem in data collection occurs with the Ernst & Ernst model, which may make it unmanageable from an administrative standpoint. The bookkeeping necessary to record the 10 minute units could require every school to maintain a school-level accountant. The problems of implementing the system in terms of effort, time, and cost appear to be overwhelming. Even if it were possible to introduce the system, the benefits over traditional systems are not apparent. It is not clear the system would provide useful management information or the added precision required for items other than salaries would justify the costs of data collection. Finally, whereas units of money are considered appropriate measures of output in the business sector, the EESEU unit is not acceptable as a measure of educational output because it does not consider quality. All 10 minute units are not equally productive, nor should they necessarily be; time is more accurately treated as input rather than as educational output.

Expert opinion in the determination of funding has only recently been used in any systematic fashion by state educational planners (Hartman, 1974). Such a method is not tied to the present situation and can, therefore, overcome the drawbacks of the empirical approach by acknowledging what should be. Another important advantage of using expert opinion is that it is simpler, faster, and less expensive than undertaking an entire cost study. It is also more flexible than the fixed data base developed and maintained in empirical studies. Thus, the expert opinion approach can facilitate innovation and change.

Nevertheless, the expert opinion method lacks the objectivity of an empirical approach. The choice of experts will be a major determinant of the results obtained. Furthermore, the results are only as good as the assumptions used to generate them. If historical input data are used by the experts, the results will be subject to the same limitations identified in the NEFP cost studies. Moreover, legislators frequently prefer empirically based data and disregard the opinions of educational experts.

The political determination of needs is discussed in greater length as part of the funding level issue in the next chapter. Suffice it to say, a wide variety of alternative cost figures is available from different empirical cost studies and final determinations are often the result of "negotiations" between various interest groups. Lobbying efforts on behalf of the more visible and more prevalent handicaps have helped focus the attention of legislators, administrators, educators, and taxpayers on the plight of handicapped children. However, the costly needs of those with more serious, and often less socially visible, handicaps have been frequently neglected. There is a strong possibility the past effects of political influence will be perpetuated if future legislation is based on historical expenditure patterns.

DIRECTIONS FOR FUTURE RESEARCH

The suggestions for future research may be summarized in the following four questions:

1. What is the relationship between the mix of resources used, costs for special education programs, and educational outcomes of the students served?
2. What are the critical factors that affect costs?
3. What are the simplest and least expensive means of isolating, recording, and monitoring special education expenditures?
4. How can accounting systems that record past expenditures be used to estimate current and future costs?

It appears much of the existing research into the costs of special education has been preoccupied with data. The process of cost determination has been largely ignored in favor of information gathering of limited utility to legislators and administrators. When change is contemplated, previous cost data are either outdated or are not available for the new configurations under consideration. This need not be the case, because there is nothing mysterious about costs: they are simply the prices of necessary expenditures for resource inputs. In the field of educational finance, however, they have become the center of focus as a result of the lack of knowledge to relate needs, goals, and methods to pupil attainment.

Future attempts to design a cost accounting system would be greatly aided by a clear understanding of the type of information that should be obtained and the feasibility of obtaining it. Research in this area cannot be confined to special education alone, but must include general education as well. Nevertheless, the particular needs of special education finance should be taken into consideration in the future development of any management information system for educational planning.

LEVEL OF FUNDING

The level of funding required to finance special education is a function of the need for such services. Need, however, is an elusive concept. It would appear that once individual program costs are known, they could simply be consolidated to yield the full funding level required. But individual program costs cannot provide information on the number of unserved handicapped children, the number served appropriately, the length of time to be spent in programs, and all the other factors that will affect funding requirements.

The disparities in funding levels among states and districts attest to the difficulty of accurately assessing these needs. Part of the differential has been shown to occur because of differing programing strategies and resource configurations, but some must also result from variations in district wealth, uneven distributions of needs, differing state philosophies, and the impact of different administrative procedures for allocating funds.

FUNDING FORMULAS

A funding formula encompasses the mandated procedures, prorating provisions, administrative guidelines, and exceptions or exclusions that determine and regulate the allocation of state funds to districts. The actual impact of a particular procedure cannot be determined without reference to all other factors - legal, political, social, educational - that interact with its actual operation.

Theoretically, the choice of a funding formula is secondary to a variety of other considerations. If it were assumed that (a) appropriate programing was established, (b) the cost of programs was known, and (c) sufficient funds were available from fiscally neutral sources, the various funding formulas would converge and produce identical allocations. The following example illustrates the point.

A given state is seeking a formula for allocating funds to its districts' special class programs, It has formulated its policies to reflect the following considerations:

1.	Programing.	The special class configuration should serve 10 students with a single teacher.
2.	Costs.	The costs are projected to be $15,000 for the teacher and administrative salaries and $5,000 for other expenses, giving a total of $20,000.
3.	Level of state funding.	The state intends to fund 50% of all educational expenditures including those of special education. The average per pupil cost of a regular program is $1,000, of which the state reimburses $500, and the average per pupil cost of the special class is $2,000 ($20,000/10) of which $1,000 is to be reimbursed.

The state could then chose any one of the following options, all of which produce identical allocations to the districts:

1.	Unit	A single unit reimbursement is $10,000.
2.	Weight	A special class student is weighted at 2.0 ($2,000/$1,000), producing a reimbursement of $1,000 per pupil (2.0 x $500) or a total of $10,000 ($1,000 x 10).
3.	Percentage	The state reimburses 50% of the total expenditure or $10,000.
4.	Personnel	Since personnel costs are $15,000, the state would choose to reimburse two-thirds of the personnel expenditures or $10,000.
5.	Straight sum	$1,000 is granted for each student, giving a total of $10,000. ($1,000 x 10).
6.	Excess cost.	The district is reimbursed by 50% of its excess cost ($2,000 - $1,000), or $500 per pupil, in addition to its foundation, resulting in a total of $1,000 per pupil or $10,000 for the program ($1,000 x 10).

ADDITIONAL POLICY CONSIDERATIONS

Age Range of Students Served. The age range often follows the state's compulsory school attendance laws, which typically mandate an age range of 5 to 18. However, there is a growing trend to expand the ages of handicapped children served in the public schools to both preschool (0-4) and postschool (18-25) ages. If preschool programs result in the child's being able to function in later years in a regular education program (perhaps with special education support) rather than in special education class, then the educational costs may be reduced in the long run.

Many preschool services provided to handicapped children are related more to the health, development, or training of a child then to his education, and could be provided by various agencies. Similarly, the vocational needs and the ages of many handicapped students make them eligible to receive services from rehabilitation or social service agencies. Coordination among the various agencies is essential to prevent dupplication of, and gaps in, services as well as to plan and implement educational services for the handicapped in an efficient manner.

INCIDENCE RATES

Most estimates are based partly on empirical evidence and partly on the judgment of the estimator. Incidence rates are simply expected prevalences. Because it is anticipated that 10% of a given population is handicapped does not mean that 10% will be handicapped.

Several factors enter into the determination of the number of children in need of special services. Two of the most important are the definition of what constitutes a handicapping condition and the assumed population on which the overall incident rate is applied.

There is some variation among the states in the overall inclusion or exclusion of particular handicaps; for example, Utah includes learning disabilities while Wyoming does not (Handicapped Children's Education Project, 1973a). Nevertheless, the principal variation in incidence rate estimates is the result of how narrowly or broadly the state defines handicapping conditions. This particularly true of functional disorders (e.g. learning disabilities, emotional disturbance) as opposed to organic disorders (e.g. blind, deaf). For example, incidence rate estimates for learning disabled children range from 1% to 28% (Froomkin, Endriss, & Stump, 1972) and those for children with emotional disorders range from 2% to 26% (New York State Commission on the Quality, Cost and Financing of Elementary and Secondary Education, 1973). Table 4 presents five estimates of the

Table 4 (BC 3)
Various Incidence Rates for Handicapping Conditions

Handicapping condition	*Hawaii*	*NEFP*	*BEH*	*North Dakota*	*New York*
Mentally retarded	1.95%	1.54%	2.300%	2.25%	2.300%
Learning disabled	2.00	1.12	1.000	5.00	26.000
Emotionally handicapped	.10	2.00	2.000	3.00	2.000
Speech impaired	3.00	3.60	3.500	5.00	3.500
Visually impaired	.03	.05	.100	.08	.100
Hearing impaired	.20	.10	.575	2.10	.575
Crippled and physically handicapped	.10	.21	.500	.50	.500
Multihandicapped and other	.01	.07	.060	.50	.070
Total	7.39%	8.69%	10.035%	18.43%	35.045%

Note. The data in column 1 are from Management Analysis Center (1974); column 2 Rossmiller et al. (1970); columns 3 and 4 Kakalik et al. (1973); and column 5 New York State Commission (1973). Figures in column 5 are a liberal estimate; the actual rate used by the Commission in its report was 9.275%.

incidence of handicapped conditions as an illustration of the extreme variations that do occur.

The second factor that can greatly influence the estimates is the assumed population on which the overall incidence rate is applied. This factor, introduced previously as part of the issue of the age range to be served, is generally overlooked in cost projection calculations. Usually, the incidence estimate is uniformly applied to the 5 to 18 year old population, although some studies use the 3 to 21 age group. However, incidence rates should be applied with careful consideration of the feasibility of providing beneficial educational services to the particular child with a given handicap. For example, applying an incidence estimate for speech impairments to the population up to age 21 would seem to greatly overestimate the current need for special services, given recent research findings that indicate in the majority of cases children over 12 years old no longer need such services (Craig & McEachron, 1974). State policy makers then have to consider the optimal ages for special education services for given handicapping conditions to determine a more accurate estimate of the population in need.

DECISION CRITERIA

Although the following criteria should be met in part by the two components - programming and funding - of any delivery system, they should nevertheless be viewed as relative concepts. Tradeoffs among them must be made, since no system can satisfy all criteria completely and simultaneously.

1. A special education delivery system should be equitable.

Equity of educational opportunity for handicapped children requires unequal amounts of expenditures for these children depending on their educational needs. An equitable finance plan should recognize the difference in the fiscal ability of "rich" and "poor" districts. This criterion applies to expenditures for capital outlay and debt service, as well as to operating expenses. The principal factor in assuring equity is the level of funding.

2. A special education delivery system should be comprehensive.

Although comprehensiveness is primarily a programming criterion, funding level is probably its most important determinant.

3. A special education delivery system should be flexible.

A system should be adaptable to changes in factors influencing program costs. Funding levels explicitly tied to actual resources will tend to be flexible.

4. A special education delivery system should promote accountability.

The prime concern is to ensure that state aid for handicapped children actually reaches those children. This criterion aims at fixing the responsibility for the proper use of special education funds and providing a means to determine whether or not that responsibility is being fulfilled adequately. Accountability relates almost exclusively to the choice of funding formulas.

5. A special education delivery system should strive to be cost-effective.

Since input-output relationships are beyond the state of the art in the field of education (Levin, 1974) formal cost-effectiveness studies are not possible, however opportunities for improving system performance do exist. Funds should be provided for start-up and evaluation costs of new programs that promise to provide services of equal quality at a lower cost. Provisions would be required for demonstration programs or teacher retraining,or both, for the successful programs applicable in other school districts. Cost-effectiveness is a function of the flexibility of a system's programming and the adaptability of the funding levels and formulas in the face of programming changes.

6. A special education delivery system should be compatible with the total educational finance system.

7. A special education delivery system should not be in conflict with the educational policies of the state.

It is essential that policy decisions be made prior to funding so the funding decisions will complement them.

8. A special education delivery system should avoid needless complexity.

APPENDIX BD

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SUMMARY

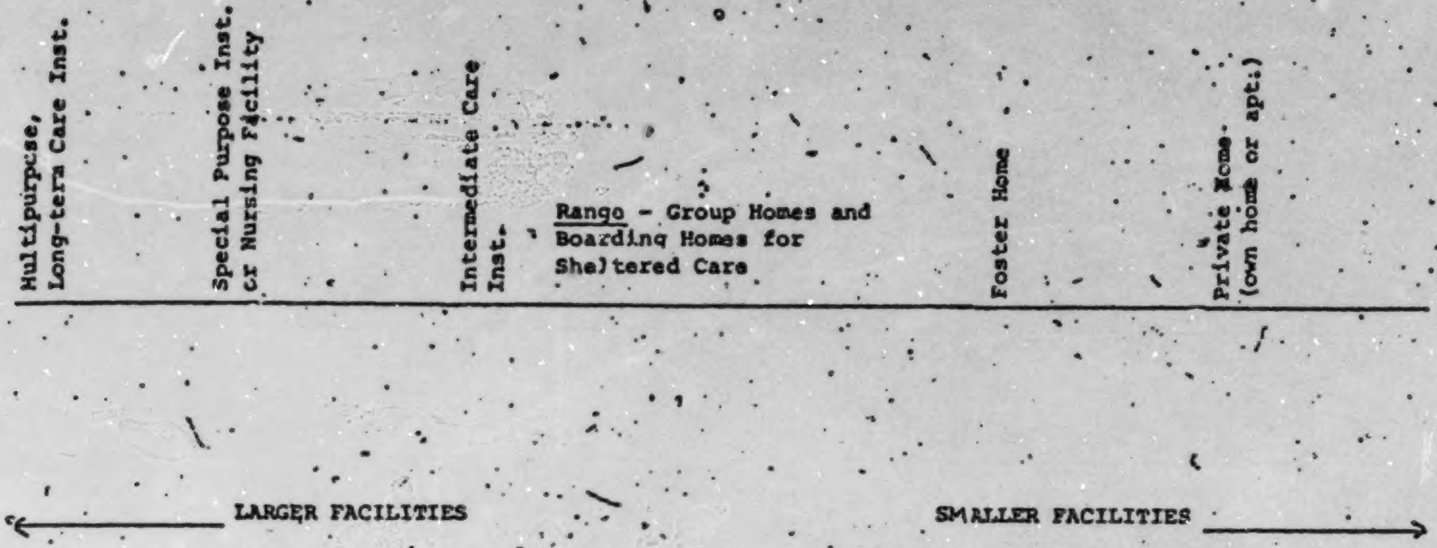
Presented is an analysis of cost benefit factors in special education showing that special education for persons with handicaps of varying severity leads to decreased dependency, increased economic self sufficiency, and longterm cost effectiveness. Considered are the following aspects: education as human capital investment, the economic benefits of special education, basic aspects of self sufficiency, the near average earnings of the mildly disabled, the greatly reduced earnings of the severely disabled, education for self sufficiency, costs of special education, costs of institutionalization, long term quantitative benefits of special education, the earnings-education ratio, special education payback via tax recoupment, payback period analysis results, positive investment return of special education, a case for public investment in special education in foreign countries. Tables include a continuum of alternative living arrangements, a continuum of education alternatives, components of special education costs, a comparison of cost indices by exceptionality and six different studies (and states), the ratio of future earnings of retarded workers to costs of their public education, and special education payback period computations.

The following were extracted for the purpose at hand.

Earnings follow-up study findings, conducted primarily on intellectually retarded subjects, suggest that the vast majority of handicapped individuals, given proper education and training, appear able to attain complete economic self-sufficiency. A small proportion --- perhaps 5 to 15% of the entire handicapped population (including most severely and profoundly retarded)---do have considerably restricted horizons from an earnings standpoint. But many of these severely disable individuals achieve partial self-sufficiency. A miniscule proportion of the age 5 - 19 school age population --- speculatively, less than one-tenth percent --- will exhibit inert or near-inert nonreactive behavior. The continuum of self-sufficiency in three functional contexts is displayed in Figures 1, 2 and 3.

Figure 1 (BD 1)

CONTINUUM OF ALTERNATIVE LIVING ARRANGEMENTS


Multipurpose, Long-term Care Inst.
Special Purpose Inst. or Nursing Facility
Intermediate Care Inst.
Range - Group Homes and Boarding Homes for Sheltered Care
Foster Home
Private Home (own home or apt.)
LARGER FACILITIES
SMALLER FACILITIES

Figures - 1, 2 and 3 : continuum of self-sufficiency in the functional contexts of living arrangements, education, and employment (New Jersey Plan in Braddock, 1976).

Figure 2 (BD 2)

CONTINUUM OF EDUCATIONAL ALTERNATIVES

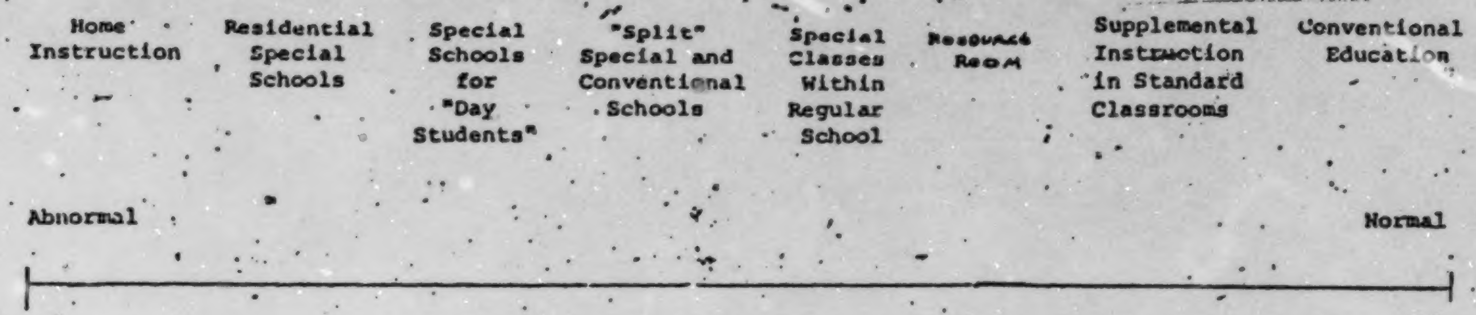
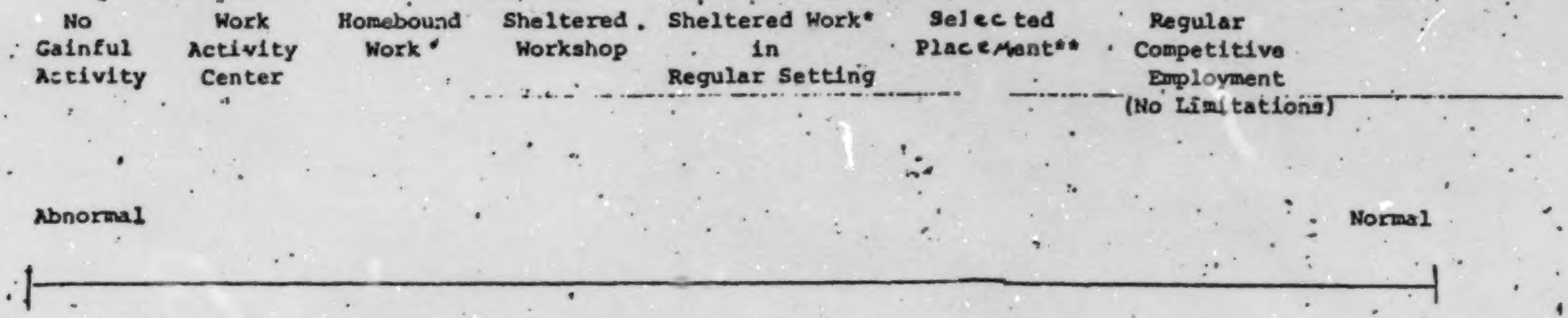

Home Instruction
Residential Special Schools
Special Schools for "Day Students"
"Split" Special and Conventional Schools
Special Classes Within Regular School
Resource Room
Supplemental Instruction in Standard Classrooms
Conventional Education
Abnormal
Normal

Figure 3 (BD 3)

CONTINUUM OF EMPLOYMENT ALTERNATIVES


No Gainful Activity
Work Activity Center
Homebound Work
Sheltered Workshop
Sheltered Work* in Regular Setting
Selected Placement**
Regular Competitive Employment (No Limitations)
Abnormal
Normal

*Sheltered work may mean work performed for less than the prevailing hourly rate, or performed under special protective circumstances (such as different physical facilities) or at less than 50% productivity.

**A regular job chosen from among a limited range of jobs suitable for the disabled person, including traineeships and apprenticeships.

Positive Investment Return Demonstrated

Inspection of the data presented in the payback period table reveals that excess costs alloted for expenditures for the education of handicapped children tends to produce a substantially positive return on investment. At prevailing Federal Government minimum wage and tax rates, a nonseverely disabled individual will pay $44,840 during a 40 year working life in direct taxes. An additional anticipated reduction in income maintenance payments, also $44,840, causes this yield on educational investment to produce a positive long-term savings gain to the community of between $51,443 for an orthopedically handicapped person and $77,079 for a mildly retarded individual. In fact, for all non-severe disability categories, the projected taxes recouped directly and also indirectly through income maintenance avoidance, exceeds the total costs of a 12-year educational experience. For example, the highest cost index -- 3.64 -- suggests that the 12 year total educational costs would be $52,722 for orthopedic handicap (12 years x $1,207 x 3.64). Direct taxes and income maintenance savings amount to $89,680 for a forty year period yielding a net long term savings of $36,958 for this most educationally expensive disability category, even based on a total cost premise.

Only in the case of severe intellectual retardation or emotional disturbance does the educational payback period exceed the normal working lifetime and therefore indicate slightly negative results in long term savings (-$11,724 and -$7,618). If, however, institutional avoidance custodial costs are considered in the computation, net long term savings also shows positive results for these severe disabilities -- on the order of $350,000 to $424,000 over a 65 year lifetime. Hence, institutional avoidance costs are the primary benefit source of long term savings to society from educational intervention in retardation and emotional disability. It is, however, erroneous to view these greatly amplified long-term savings computations literally as guaranteed returns on investment. Rather, a more proper interpretive stance is to consider these estimated savings as a form of potential investment return, which may or may not be reached, depending, among other things, upon the self sufficiency attained by a disabled individual over his lifetime. Some, perhaps all, of the institutional avoidance savings computed in the payback model will no doubt need to be redeployed through community-based educational, social service, and health programs to finance partial and in a few cases complete support of a small, but very costly portion of the disabled target population. Hence, we can conclude only that as the severity of cognitive or emotional handicap increases, the payback period lengthens, and the potential for a positive investment return diminishes primarily because employment earnings and also institutional avoidance savings are less likely. The educational experience itself also tends to be more expensive.

COMMENT

This study effectively demonstrated the financial benefits which accrue in the long-run as a result of the education and training of handicapped persons.

It was noted that the greater the degree of handicap the lower were the accumulated benefits. Though this kind of study is needed to clarify the financial dynamics, it should not be construed as a justification of education. The right to an education has been well-established for normal children on other than strictly economic grounds. Recent legislation in the United States recognises and enforces the right to education of all children irrespective of handicapping condition.

Braddock cautioned his readers that his "analysis has not considered at all the psychosocial benefits of education for the handicapped individual, his family, and the community and society at large. Quantitative or cost analysis logic is at best only slightly relevant to the problem of evaluating public investment decisions in special education. Income redistribution to classes and regions and the promotion of individual self sufficiency is the overriding objective in most public programs".

APPENDIX CA

Clemmons, A. L. An assessment of cost variations in selected exemplary special education programs in six selected Minnesota school districts. Unpublished doctoral dissertation, University of New Mexico, 1974.

The purpose of this dissertation was to obtain data for Minnesota regarding the relative cost of regular school programs and programs for various categories of exceptional children. Cost information was analyzed according to the resource inputs that contribute to the cost of exceptional programs. The relative cost differences between various delivery systems (i e., program alternatives) were also obtained. Six Minnesota school districts selected on the basis of expert opinion served as the data base.

Within each district, direct and indirect costs were calculated for seven exceptional program categories for each of 12 expenditure categories on a per pupil basis. Per pupil costs for the regular school program in each district were also obtained. Cost indices for the exceptional programs were then developed from these data. The author also calculated program costs according to six delivery systems: regular classroom with consultant, regular classroom with itinerant teacher, regular classroom with resource room, part time special education classroom, self contained special education classroom, and homebound or hospitalized instruction.

Because of the small sample size, examples of each of these program types were not found in all of the six districts. The author recommends that future studies aimed at examining the cost variations between delivery systems use a larger sample and that the sample be chosen on the basis of the existence of given program alternatives rather than on an exemplary school district or program category basis.

Comment

The method of investigation in this dissertation is similar to that developed by the NEFP in its 1970 study (Rossmiller et al.), but the development of empirical cost comparisons on the basis of program alternatives is uncommon. Given the limited sample, however, the program alternative indices should be regarded as tentative.

(Above taken from Bernstein et al (1976))

APPENDIX CB

AUTHOR: Colorado State Dept. of Education, Denver.

TITLE: Education of handicapped children: status report. School year 1974-75 and midyear 1975-76.

PUBLISHER/JOURNAL: Same as Author

DATE: 1975

NO. OF PAGES: 61

ERIC NO.: ED 128 986

SUMMARY

The 1975 status report on education of handicapped students in the state of Colorado was organized around six questions, with tables accompanying each one:

I. Who were the handicapped students served during 1974-75?

50,453 students (average daily attendance) obtained special education services, that is, 9.5% of the total student population of 529,571.5. These special students accounted for 77,392 handicapping conditions, an average of 1.5 per student. At the close of the school year, 9,035 students awaited placement in special education programs. See tables IV and V.

II. How were the handicapped students served?

Colorado's 181 school districts had been organized into 43 administrative units for the purpose of providing special education programs as required by Colorado's Handicapped Children's Educational Act. The Act stipulates the provision of appropriate educational programs in settings which are the least restrictive. The planning and provision of comprehensive quality programs was discussed under (A) the identification of needs through screening programs, referral procedures, individual student assessments and staffing; (B) the development of individual student plans and the provision of alternative systems for delivering instructional and support services; (C) the evaluation of services delivered through a review of student accomplishments, a study of quantitative information prepared for the Dept. of Education and, for some units, a report prepared by an on-site visitation team. See Table VII.

III. What staff was required to serve the handicapped students?

The total number of full-time equivalent staff members was 3,071.77. Of this number 73.8% were educational program staff, 2,051.53 teachers and 214.98 aides. The remaining 26.2%, or 805.26, were support service staff including those in administration and supervision. Distribution and functions of staff were discussed. See Tables VIII to XI.

IV. What were the costs and revenues for educating handicapped students?

The direct cost amounted to $39,358,976.00, that is, 6.0% of the total general operating expenditures of $661,331,297. The costs of regular education attributable to educating handicapped children were identified; the total cost of special education became $90,886,424.00 or 13.7% of the total general operating expenditures. Per pupil costs by program category and other cost accounting were presented. Revenues for special education were also discussed. See Tables XVI to XVIII.

V. What was the impact of special education?

Student outcomes were measured according to pre- and post-testing of their ability to function in a regular classroom setting. Students in the program for visually handicapped entered on the average at a higher functioning level than students in other programs, while autistic children entered with the lowest average functioning level. The program for hearing handicapped reported the highest index of change. Evaluation of progress must rest on comparative data to be collected over the next few years.

Staff expections of student progress were discussed, as well as status and effectiveness of program implementation. See Tables XXIII and XXIV.

VI. What was the impact of the inservice program for regular staff?

11,500 members of the school staff, or approximately one-third of the total staff statewide participated in the inservice programs, at a cost of $1,980,856.00 or $172.00 per participant. Inservice objectives were discussed. See Tables XXVI to XXVIII.

VII Where do we stand for the year 1975-76?

Numerous topics were discussed, such as continued program implementation, increased enrollments and staff requirements. Child Find Projects were scheduled to update information on the number and location of handicapped school age children who were not currently being served in special education programs, and identify the handicapped children of age birth to five. Inservice programs were planned for 14,236 staff members.

A review of current trends indicated that continuity of services was becoming important with the increased complexity of handicapping conditions of new pupils, increased number of special education secondary programs, and new programs at the pre-school level and for the severely retarded.

End-of-Year Status of Special Education Students Served

Of the 50,453 identified students served during the 1974-75 school year, 12,035, or 23.9 percent, were reported at the end of the year to no longer have a need for, therefore not be eligible for, a special education program at that time. Of the students served during the past year, 54.9 percent were reported to have been recommended for retention in special education programs for the 1975-76 school year. These figures are reported in Table IV.

TABLE IV (CB 1)

End-of-Year Status of Special Education Students Served 1974-75

	Status at End-of-Year	Number of Students	Percent of Total Served
1.	Retained for Next Year *(1)*	27,706	54.9%
2.	Dismissed from Special Education *(2)* - Objectives Accomplished	12,035	23.9%
3.	Left the District *(3)*	4,749	9.4%
4.	Graduated from School *(4)*	869	1.7%
5.	Withdrew from Program *(5)*	796	1.6%
6.	Dropped Out of School *(6)*	563	1.1%
7.	Other/Unclassified *(7)*	3,735	7.4%
	TOTAL STUDENTS SERVED	50,453	

(1) Students who are working on special individual objectives and who may have made good progress on their objectives during the year but, because of the nature of their handicapping condition(s), will need to be served by special education the following school year

(2) Students who became ineligible for special education because they accomplished their individual special objectives and became able to function and benefit from a regular education program without further service from special education at this time

(3) Students who moved away from the district while still enrolled in a special education program

(4) Those secondary students who were enrolled in special education at the time of graduation

(5) Students who were withdrawn from the special education program for reasons such as parental request

(6) Students who were in a special education program and dropped out of school upon reaching the age when they were no longer covered by the compulsory attendance requirement

(7) Students who were temporarily health handicapped, temporary detention center placements, or transfers to new levels with no program available

The percentages of students in each of the special education categorical programs reported to have accomplished their special individual objectives during the school year so that they could function and benefit in a regular education program, are shown in Table IV. Because of the nature of the handicap, it is expected that certain categorical program areas will show a much higher retention figure than others. This is due to the fact that some students may need to be served by special education during all of their school years but to lesser degrees as they learn to effectively compensate for their handicap and function in regular education programs. The program for students with a significant limited intellectual capacity provides an example of a program where a comparatively higher retention rate is expected.

TABLE V (CB 2)

Percent of Special Education Students Dismissed with Objectives Accomplished and Those Retained for the Following Year 1974-75

Program	Total Number Served	Dismissed with Objectives Accomplished	Percent Retained
Significant Limited Intellectual Capacity	7,632	4.4%	76.8%
Emotional/Behavioral	4,112	21.6%	34.4%
Perceptual Communicative	14,048	20.0%	64.0%
Hearing Handicapped	863	28.0%	59.4%
Visually Hanidcapped	303	5.6%	79.9%
Physically Handicapped	933	41.6%	37.2%
Speech	18,975	37.6%	52.4%
Pregnant Girls	326	46.9%	5.2%
Adjudicated Youth	2,722	1.1%	.2%
Autistic	50	0%	58.0%
Deaf/Blind	16	0%	94.8%
Multiply Handicapped	473	8.9%	68.5%
Individual Students Served*	50,453	23.9%	54.9%

*The remaining 21.2 percent not accounted for above either left the district, graduated, withdrew, dropped out of school, or no longer need temporary services.

TABLE VII (CB 3)

Number of Students and Full-Time Equivalent* (FTE) Students Served in Delivery Systems 1974-75

	Itinerant/ Consultant Services		Resource Room		Self-Contained Special Class		Detention Center Program		Work-Study Program		Home-Hospital Program		Total Served in Categorical Program	
	Number of Students	FTE Students	Number of Students	FTE Students	Number of Students	FTE Students	Number of Students	FTE Students	Number of Students	FTE Students	Number of Students	FTE Students	Number of Students	FTE Students
Limited Intellectual Capacity	97	22.27	1,628	382.09	6,026	3,269.33			1,433	1,060.34	60	17.63	7,032	4,932.16
Emotional/Behavioral	1,477	24.48	1,634	142.64	992	568.16	346	3.03	116	75.96	167	3.75	6,112	769.38
Perceptual/Communicative	846	44.79	12,400	1,399.19	713	251.94			66	13.95	25	1.22	18,043	1,716.09
Hearing Handicapped	209	11.49	307	59.10	210	167.05			13	10.91	229	7.60	863	236.13
Visually Handicapped	271	20.73	32	14.63									303	43.10
Physically Handicapped	30	8.31	41	6.50	267	211.66			6	1.37	589	35.63	933	301.67
Speech	17,616	429.77	1,067	30.21	209	13.00			1	1.00	2	.11	18,973	474.11
Pregnant Girls					164	67.20					162	4.61	326	71.81
Adjudicated Youth							2,722	29.57	9	.83	1	.05	2,722	29.57
Autistic	6	.05	6	.39	38	19.78							50	31.13
Deaf/Blind					15	10.17			1	.73			16	10.90
Multiply Handicapped	8	3.30	287	38.75	149	112.32	—	—	3	3.17	24	.50	471	157.94
Total Served in Delivery Systems	20,348	573.58	16,497	2,278.00	7,611	4,690.60	3,068	32.60	1,670	1,170.20	1,239	71.10	50,453	8,790.96
**Percent Served in Delivery Systems, Excluding Speech	5.8%		30.6%		14.1%		6.1%		3.2%		2.3%			
Percent Served in Delivery Systems, Speech Only	94.9%		2.1%		.6%									
Average Hours Served per Year, Excluding Speech	48.48		143.89		644.65		20.43		644.12		56.81			
Speech Only	24.13		28.03											

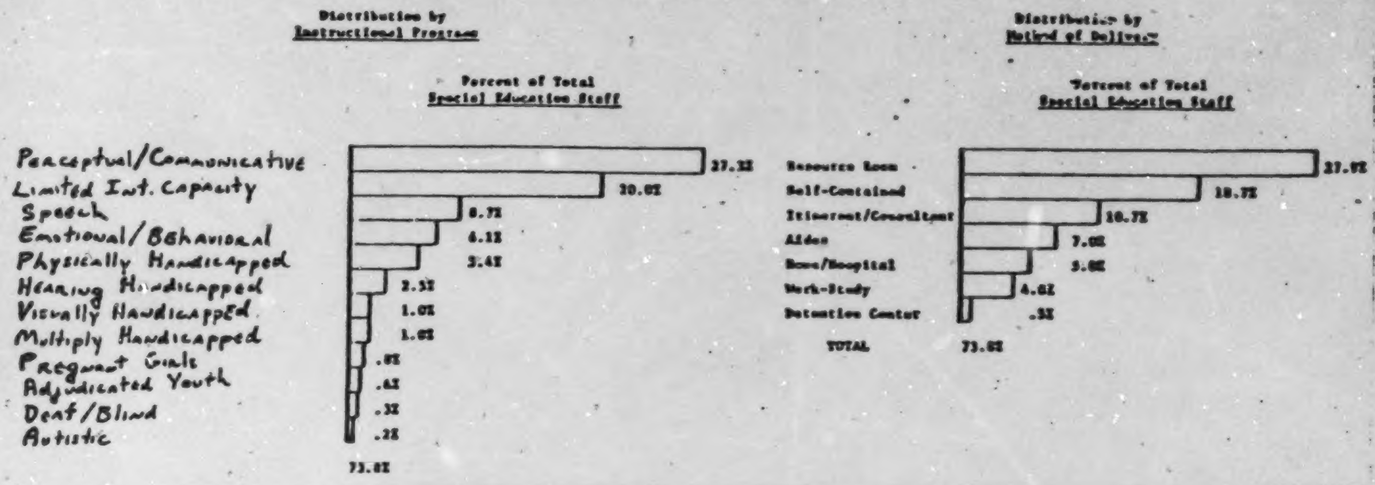
* One FTE is equal to 990 hours
** Will not equal 100 percent due to rounding

159

160

TABLE VIII (CB 4)

Distribution of Instructional Personnel by Program and Method of Delivery 1974-75



N.B. 2,051.53 teachers and 214.98 aides composed the 73.8%. The remaining 26.2%, or 805.26 full-time equivalent positions were support service staff.

TABLE IX (CB 5)

Full-time Equivalent Instructional Personnel by Method of Delivery 1974-75

	Itinerant/ Consultant Services	Resource Room	Self-Contained Special Class	Detention Center Program	Work-Study Program	Home-Hospital Program	Total FTE Teachers Employed	Total FTE Aides Employed	Total FTE Instructional Staff	Total FTE Instructional Staff State Approved and Reimbursed
Limited Intel. Capacity	2.50	73.63	306.66		103.10	5.00	570.91	42.15	613.06	632.29
Work-Experience-Study										121.79
Emotional/Behavioral	3.00	37.70	83.18		3.00	11.93	137.81	50.54	188.35	134.82
Perceptual/Communicative	49.00	693.63	16.90		10.00	3.05	774.98	62.39	837.37	679.08
Hearing Handicapped	14.25	20.22	29.30		3.00		66.77	10.25	77.02	67.38
Visually Handicapped	19.80	6.00			1.00	.50	27.30	2.20	29.50	23.66
Physically Handicapped	1.00	3.00	22.00		2.00	117.33	145.33	21.00	166.33	26.60
Home/Hospital										31.40
Speech	237.89	21.90	1.00			1.00	261.79	3.00	264.79	252.78
Pregnant Girls			9.40			11.92	21.32	2.50	23.82	7.75
Adjudicated Youth				16.15			16.15	2.50	18.65	10.16
Autistic			3.00				3.00	4.50	7.50	3.00
Deaf/Blind	1.00		4.60				5.60	1.60	[illegible]	1.25
Multiply Handicapped			18.60		1.00	1.15	21.75	8.35	30.10	27.53
Teachers	328.44	857.70	576.26	16.15	122.10	157.90	2,051.53			1,870.33
Aides								214.98		230.38
Instructional Staff									2,266.51	2,100.91

* The number reimbursed will be greater than the number reported to have been employed. This is due to the difference in the way [illegible] classified for reimbursement purposes as compared to the classification of personnel for reporting total costs of programs. In [illegible] inaccuracies in calculating a full-time equivalent at the local unit level will occur. One full-time equivalent staff member is [illegible] 1,??0 hours during the school year.

N.B. Illegibility was present in document reviewed.

TABLE X (CB 6)

Time Distribution of Special Education Teachers Assigned to Three Major Delivery Systems 1974-75

Functions	Self-Contained Percent of Time Spent	Resource Room Percent of Time Spent	Itinerant/Consultant Percent of Time Spent
Instructing	66.8%	62.0%	36.6%
Assessing, Screening, Testing	3.7%	8.5%	10.4%
Staffings	2.4%	3.8%	4.0%
Consulting with Parents	3.9%	3.8%	4.1%
Consulting with Staff	4.6%	6.7%	16.0%
Planning and Managing	14.9%	11.7%	8.8%
Inservice Instructing	.3%	.7%	13.6%
Traveling	.5%	.6%	6.7%
Other	2.5%	1.8%	4.6%

TABLE XI (CB 7)

Average Yearly Case Loads for Teachers in Categorical Programs by Delivery Systems 1974-75

	Itinerant/ Consultant Services	Resource Room	Self-Contained Special Class	Detention Center Programs	Work-Study Programs	Home/Hospital Programs
Limited Intellectual Capacity	34.8(1)	19.4	12.0		14.1	8.0
Emotional/Behavioral	492.3(1)	27.4	11.5		15.2(2)	12.2(3)
Perceptual/Communicative	17.2	17.8	43.2			
Hearing Handicapped	14.7	10.0	7.2			
Visually Handicapped	13.7	5.3	--			
Physically Handicapped	30.0	13.7	12.1			22.1(3)
Speech	74.1(4)	49.6	—			
Pregnant Girls			17.5			13.6
Adjudicated Youth			--	191.2(5)		
Autistic			9.3			
Deaf/Blind			3.3			
Multiply Handicapped			8.0			21.0

(1) In the Limited Intellectual Capacity programs, 2.5 teachers reported affecting a total of 87 students with mild handicapping conditions by providing consultant services to the teachers of those students. In the Emotional/Behavioral programs, three teachers reported affecting 1,477 students with mild handicapping conditions by providing consultant services to the teachers of those students.

(2) An average case load of the emotional/behavioral and perceptual/communicative categories combined is reported, since the students reported by the units may be classified somewhat differently than the teachers. This presents a more realistic figure.

(3) The case load reported here uses the full-time equivalent number of reimbursed teachers rather than the number of employed teachers since the calculation of an accurate full-time equivalent for home/hospital staff was difficult at the local level.

(4) It is significant to note the drop from a case load of 1/107 reported for 1973-74. This may be attributed to the complexity of handicapping conditions being identified and served, and the emphasis on improving quality of services delivered as shown in the increase in length of time one student on the average spent in the speech program.

(5) Students included in this case load are generally in the detention center for a very short time (two weeks or less).

TABLE XVI (CB 8)

Number of Students Served, Direct Instructional and Support Costs and Per Student Direct Cost for Each Special Education Program 1974-75

Program	Number of Individual Students Served	Direct Special Education Instructional Cost	Direct Special Education Support Services Cost	Percent of Total Direct Special Education Cost	Direct Special Education Per Student Cost
Limited Intellectual Capacity	7,632	$ 7,405,201	$ 7,506,781	37.9%	$1,953.88
Emotional/Behavioral	4,112	1,881,874	1,236,251	8.0%	758.79
Perceptual/Communicative	14,048	9,811,780	2,793,079	32.0%	897.27
Hearing Handicapped	863	974,015	439,683	3.6%	1,638.12
Visually Handicapped	303	394,969	85,799	1.2%	1,586.69
Physically Handicapped	933	897,597	439,499	3.4%	1,433.11
Speech	18,975	3,276,342	839,004	10.5%	216.89
Pregnant Girls	326	181,132	122,724	.8%	932.07
Adjudicated Youth	2,722	214,950	25,635	.6%	88.39
Autistic	50	62,529	40,336	.3%	2,057.30
Deaf/Blind	16	61,480	18,190	.2%	4,979.38
Multiply Handicapped	473	333,441	334,483	1.7%	1,412.11
TOTAL	50,453	$23,475,310	$13,843,466		

TABLE XVII (CB 9)

Total Attributable Costs for Educating Handicapped Students by Categorical Program 1974-75

Program	Number of Students	Total Attributable Cost	Percent of Total Attributable Cost	Per Student Cost
Limited Intellectual Capacity	7,632	$18,254,726	20.1%	$2,391
Emotional/Behavioral	4,112	6,734,444	7.4%	1,638
Perceptual/Communicative	14,048	27,799,327	30.6%	1,978
Hearing Handicapped	863	2,225,578	2.5%	2,578
Visually Handicapped	303	797,385	.9%	2,631
Physically Handicapped	933	2,196,326	2.4%	2,354
Speech	18,975	27,587,362	30.4%	1,453
Pregnant Girls	326	612,976	.7%	1,880
Adjudicated Youth	2,722	3,448,141	3.8%	1,266
Autistic	50	116,297	.1%	2,325
Deaf/Blind	16	80,008	.1%	5,000
Multiply Handicapped	473	1,033,854	1.1%	2,185
TOTAL	50,453	$90,886,424		

Costs of the Special Education Support Services

The total direct special education cost for support services, $13,883,466, was attributed to seven service areas. The areas of support services, the cost for those services, and the percent of the total direct special education cost they represent is illustrated in Table XVIII.

TABLE XVIII (CB 10)

Direct Special Education Costs
for Support Services and the Percent They Represent
of All Special Education Costs
1974-75

Service	Cost	Percent of Total Direct Special Education Cost
Assessment and Consultation	$ 5,259,315	13.4%
Administration and Supervision	2,907,223	7.4%
Health	2,724,536	6.9%
Transportation	2,009,592	5.1%
* Specialty Training	399,317	1.0%
Inservice for Special Educators	137,161	.3%
Instructional Materials Centers	446,322	1.1%
TOTAL	$13,883,466	35.2%

* Includes music, art, adaptive physical education, home economics and industrial arts for special education students

TABLE XXIII (CB 11)

Functioning Level of Students on Entry* into a Special Education Program and at End-of-the-Year as Reported on a Seven-Point Scale

1974-75

	Limited Intellectual Capacity		Emotional/ Behavioral		Perceptual/ Communication		Hearing Handicapped		Visually Handicapped		Physically Handicapped		Speech		Autistic		Deaf/Blind		Multiply Handicapped		Degree of Interference with Learning in a Regular Education Program	Most Likely Placement Program
	Percent on Entry	Percent at End of Year	Percent on Entry	Percent at End of Year	Percent on Entry	Percent at End of Year	Percent on Entry	Percent at End of Year	Percent on Entry	Percent at End of Year	Percent on Entry	Percent at End of Year	Percent on Entry	Percent at End of Year	Percent on Entry	Percent at End of Year	Percent on Entry	Percent at End of Year	Percent on Entry	Percent at End of Year		
7	1.5	3.9	0.6	0.1	0.1	6.5	0.6	6.0	1.0	5.0	1.6	29.6	1.0	12.6						6.3	7 Interferes None with Functioning in Regular Education Class	Placement in Regular Education Classroom
6	4.4	8.2	6.3	24.4	3.8	17.7	3.3	8.3	23.4	30.6	10.7	33.7	8.1	13.2	3.0	6.1		6.3	1.1	12.8	6 Interferes Little with Functioning in Regular Education	Consultive Services Provided to Regular Education Teacher
5	11.3	24.8	17.6	24.4	17.6	25.3	30.3	30.0	43.0	42.0	15.7	15.0	40.6	30.1	2.0	12.2	6.1	12.5	10.6	21.0	5 Interferes Some with Functioning in Regular Education	Placement with Special Education Itinerant Program
4	22.0	34.1	34.2	21.0	40.7	37.5	16.6	29.6	18.3	12.6	10.1	9.4	23.7	25.6	14.3	30.6	43.0	6.3	30.0	18.6	4 Interferes Much with Functioning in Regular Education	Placement in Special Education Resource Program
3	47.0	28.0	28.3	14.9	21.1	20.3	23.3	20.3	6.0	4.3	29.0	20.4	24.5	3.6	25.3	20.4	25.0	31.3	20.6	28.0	3 Interferes Most with Functioning in Regular Education	Placement in Self-Contained Special Education Classroom
2	8.0	4.9	0.3	4.6	4.8	2.8	12.3	3.7	2.3	1.0	10.0	3.5	1.3	0.2	12.2	26.8	12.5	12.5	11.0	9.8	2 **Extreme** Interference	Placement in Special Facility
1	4.1	2.9	0.8	3.3	3.7	2.8	23.0	7.6	1.0	3.7	2.9	2.5	0.6	0.8	42.9	4.0	12.5	6.3	16.0	4.1	1 **Total** Interference with Regular Education	Placement other than a Public School, i.e., Institution
*Number of Students	7,632		4,113		14,048		863		303		933		18,975		37		16		673			
*Average Entry Level on the 7 Point Scale	3.46		3.62		3.82		3.09		4.88		3.70		4.32		2.27		3.19		3.26			
*Average End of Year Level on the 7 Point Scale	3.93		4.66		4.63		4.36		5.27		4.93		5.28		3.18		3.50		4.06			
**Index of Change on the 7 Point Scale	.47		1.04		.81		1.27		.39		1.23		.96		.91		.31		.80			

* Special education students may have been rated on the seven-point scale as 7 (Interferes None with Functioning in Regular Education Class) at the time of entry into the special education program if they had a handicapping condition which was very mild, temporary in nature, or one which did not need to interfere with "learning" in a regular education program. An example may be a student with broken legs who might need some training from a specialized person in mobility, or in adapting to special equipment, etc.

**The index of change is the difference between the average functioning level on entry and that for the end of the year.

TABLE XXVI (CB 12)

Inservice Participants
1974-75

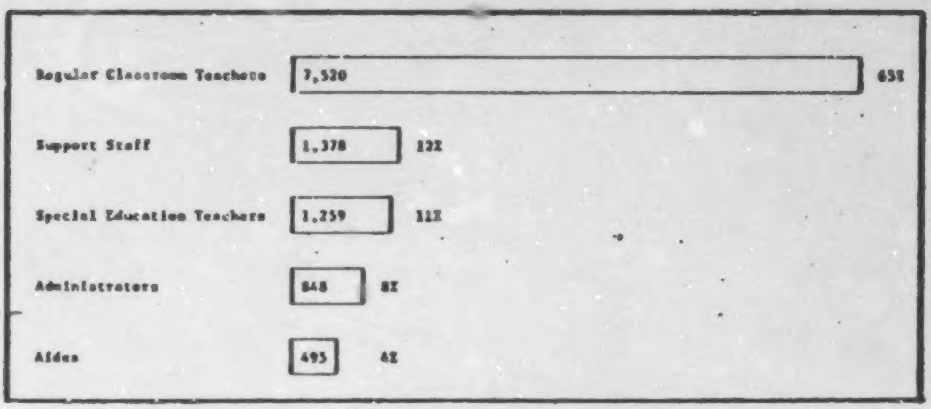


TABLE XXVII (CB 13)

Inservice Participants as a Percentage of the Staff in the State
1974-75

	Inservice Participants	State Total	Participants as a Percent of State Total
Regular Classroom Teachers	7,520	25,695	30.0%
Special Education Teachers	1,259	2,052	61.4%
Aides	495	--	—
Support Staff	1,378	2,492	55.0%
Administrators	848	1,994	43.0%
TOTAL	11,500	32,233	35.8%

TABLE XXVIII (CB 14)

Inservice Objectives and Accomplishments Made by the Participants 1974-75

Objective Statements	Total Participants Attempting this Objective	Percentage not Completing this Objective	Percentage Partially Completing this Objective	Percentage Completing this Objective
A. Overview of Special Education				
1. Identification of Handicapped Student	8,105	4.7%	33.8%	61.5%
2. Effects of Handicaps on Learning	7,037	4.0%	32.1%	63.9%
3. Role of Special Education Services	8,530	4.6%	32.8%	62.4%
B. Special Education Program Development				
1. Use of Screening Instruments	5,803	6.1%	35.9%	58.0%
2. Referral Procedures	5,326	14.3%	32.9%	52.8%
3. Determining Student's Need through Assessment Instruments and Other Methods	6,676	6.9%	34.1%	59.0%
4. Staffing Function and Team Procedures	7,426	10.0%	33.3%	56.7%
5. Modification of Existing Programs	5,722	6.5%	36.8%	56.7%
6. Student Progress Evaluation	3,717	5.4%	36.1%	58.5%
7. Preparation of Information for Staffing Team	2,783	7.7%	32.1%	60.2%
8. Utilizing Evaluation Information to Improve Programs	4,216	5.1%	38.7%	56.2%
C. Special Instructional Skills				
1. Instructional Techniques and Methods for Students with Special Needs	8,522	4.3%	32.5%	63.2%
2. Instructional Materials or Equipment	7,165	5.1%	32.6%	62.3%
3. Effective Utilization of Outside Resources	4,356	6.1%	31.8%	62.1%
4. Methods of Group and Individual Student Management	6,461	7.9%	31.6%	60.5%
D. Positive Attitudinal Change of Participants Toward Handicapped Students	4,888	7.4%	33.6%	59.5%

TABLE CB15: Costs per Full-time Equivalent Student in Categorical Programs, According to Total Direct Instructional and Support Costs and Total Attributable Costs: 1974-75

PROGRAM	NO. OF STUDENTS	FTE STUDENTS	TOTAL DIRECT INSTRUCTIONAL AND SUPPORT COSTS PER FTE STUDENT	TOTAL ATTRIBUTABLE COSTS PER FTE STUDENT
Limited Intellectual Capacity	7,632	4932.14	$3,023	$ 3,701
Emotional/Behavioral	4,112	769.38	4,055	8,753
Perceptual/ Communicative	14,048	1710.69	7,368	16,250
Hearing Handicapped	863	234.15	6,038	9,492
Visually Handicapped	303	43.18	11,134	18,467
Physically Handicapped	933	261.67	5,110	8,393
Speech	18,975	474.11	8,681	58,188
Pregnant Girls	326	71.89	4,227	8,527
Adjudicated Youth	2,722	29.57	8,136	116,609
Autistic	50	21.17	3,914	5,493
Deaf/Blind	16	10.90	7,309	7,340
Multiple Handicapped	473	159.94	4,176	6,464
TOTAL:	50,453	8,720.76		

N.B. Based on Tables VII, XVI and XVII

COMMENT

This study provided numerous informative tables on the deployment of resources, program implementation and student outcomes which would be very useful in the planning and management of special education services. The integrated information system employed undoubtedly accounts for the quality of the information.

Unfortunately, special attention was not given to costs. Though per pupil costs were presented, cost indices were not calculated. Method of attributing general expenditures to special education services was not explained. Costs of different delivery systems were not explored.

Since regular education costs were not presented, cost indices could not be calculated. Costs per student across programs were presented instead of per FTE student. Using the data presented in Tables VII, XVI, and XVII, costs per FTE student were calculated for total direct and instructional support costs and for total attributable costs. The results are present in Table CB15.

Total direct program costs per FTE student ranged from $3,023 for Limited Intellectual Capacity to $11,134 for Visually Handicapped, with a mean cost of $6,098.

The danger of using total attributable costs instead of total direct costs was underlined by the dramatic cost increase in certain programs. For example, cost per FTE student in the speech program went from $8,681 for total direct costs, to $58,188 for total attributable costs. Such high costs were probably due to initial capital outlays to establish a program and other unusual costs. It was concluded that total attributable costs should not be used for on-going program comparisons.

APPENDIX CC

Colorado Department of Education. Report on study of learning disabilities: A report to the forty-ninth Colorado General Assembly. Denver: Author, 1973.

Colorado's House Bill 1060 (1972) required a report on the effects of its amendments to the Handicapped Children Educational Act. This report covers eight topics, including five that relate to finance: the cost and effectiveness of current programs (Section 1), recommended programs and standards (Section 5), cost-benefit and cost-effectiveness (Section 6), financial implications (Section 7), and the development of an accountability instrument (Section 8). Sections 1, 3 (incidence figures), and 5 are complemented by supporting documents bound separately.

The cost studies are derived from local agency documents that must accompany requests for state reimbursement. In Section 5, costs are computed according to the type of delivery system, personnel requirements, and the severity of the handicap. The supporting document (5-1) includes a discussion of program outcomes as well as an analysis of the key determinants of cost variation.

Comment

This document provides an excellent framework for the analysis of special education programs. The treatment of delivery systems, educational handicaps by severity, and measurable outcomes outlines a practical approach for implementing current *best practice* theory.

(The term *learning disabilities* in the title of this report refers to handicapping conditions in general, rather than the specific category known as learning disabilities.)

(Above taken from Bernstein et al (1976))

APPENDIX DA

AUTHOR: Department of Health, Education, and Welfare, Washington D.C., Office of the Secretary.

TITLE: Handicapped persons: Nondiscrimination. Part V.

PUBLISHER/JOURNAL: Federal Register, vol. 41, no. 96, pp. 20296 - 379

DATE: 1976

NO. OF PAGES: 87

ERIC NO.: ED 123 823

SUMMARY

Presented by the Department of Health, Education and Welfare are proposed rules regarding section 504 of the Rehabilitation Act of 1973, which prohibits discrimination in federal programs on the basis of handicap. Detailed are costs, benefits, and inflationary impact of implementing provisions related to the following areas (with sample topics in parentheses): employment practices (compensation and fringe benefits); program accessibility (existing facilities and new construction); preschool, elementary, and secondary education (free education and non academic services); higher education (admissions, housing, health and insurance); and health, welfare, and social services (education of institutionalized persons). Annual costs were estimated at 2.4 billion dollars, with elementary and secondary education accounting for $2.3 bi. Annual benefits amounted to $2.1 bi. with elementary and secondary education accounting for$1.5 bi., leaving a pecuniary cost deficit of only $.3 bi. per year to be balanced against psychic benefits.

The following were extracted for the purpose at hand.

PROGRAM ACCESSIBILITY

Two standards are established for program accessibility — one for new construction and alteration (Sec. 84.23), the other for existing buildings (Sec. 84.22). New construction and design must at a minimum, meet the standards for barrier free construction established by the American National Standards Institute (ANSI). Any alteration of existing buildings which is undertaken must also conform to the ANSI standards if the alteration involves work on a portion of the facility which is covered by the ANSI standards, such as toilets, elevators, stairs, and curbs.

The Office of Facilities, Engineering and Property Management (OFEPM), HEW, recommends that for budget purposes the cost of barrier-free new construction be estimated at one-half of one percent (0.5%) of the total project cost.

Estimated cost of modifying existing buildings was based on two HEW accessibility projects giving a low estimate of 0.517% of the property value, and seven governmental projects for a high estimate of 1.13% of the property value.

CHILDREN VULNERABLE TO MIS-LABELING

The major current concern of specialists in the area of education of handicapped children is the negative effect that the very process of labeling and assignment to identifiable special classes may have on handicapped children. A number of facts suggest the widespread existence of misdiagnosis and misassignment.* This growing concern has resulted in an acceleration of the "Mainstreaming" movement — i.e., the placing of handicapped children in the abosultely least restrictive setting possible. Another effect of this concern has been to focus even greater attention on the issue of mistaken diagnosis and the resulting compounding negative effect on the child's life chances.

Most of the major court decisions have spelled out in detail the type of testing, screening and mandatory re-examination procedures that must be followed by state school administrators in determining whether a child is handicapped or not and if so what type and degree of severity.

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* Hobbs, Nicholas. The Futures of Children
Jossey-Bass, Washington, D.C.: 1975
Almost the entire book is devoted to this issue.

Program Costs

The only available cost factors based on a systematic and identifiable sample of schools were those done by Rossmiller, Hale and Frohreich in their well known 1969 study for the National Education Finance Project. They present excess cost estimates by type of handicapping category for a sample of "outstanding" school systems, i.e., ones which were selected on the basis of a panel of experts saying that they had exemplary special education programs. Unfortunately, they did not present any analysis of their cost factors by severity of handicap within a type category. However, they did present a detailed narrative discussion of the programs in each of the systems they served and there was variation in types of programs offered within a handicapping category. At any rate their published data allow for selecting excess cost factors along a range from high to low.

Table 8 contains various estimates of excess cost multipliers to apply to the numbers of unserved handicapped children in Table 7. Although these cost estimates are based on one of the better known studies in this field, they still suffer from a number of conceptual ambiguities that make them difficult for us to utilize.

For example, the authors make clear that they obtained all of the components of their per pupil cost factors on the basis of full-time equivalent average daily memberships. Thus, the school districts surveyed were asked to allocate a handicapped students' time to both regular classes and special classes if, in fact, he did not spend all his time in special classes. However, in their summary tables, the authors only report the figures that would be applicable for a "full-time" special education student. They do not report what fraction of his time a typical special education student (in the districts surveyed) actually spent in a special education setting. To use their reported excess cost factors as they are we would have to assume that our typical unserved handicapped child will require a program delivered entirely in a separate special education setting (either in a separate classroom in a regular school building or a separate building). We did assume this for our "high side" cost factors. For our "low-side" cost factors we assumed that the typical unserved student would spend 1/2 of his time in special educational settings and 1/2 in a regular setting. We computed a simple average of the per student cost of a full-time special education student and that of a regular student that were reported by Rossmiller et al.

There are a few other serious problems with utilizing the factors reported in the Rossmiller study. The rather high figure they report for physically handicapped probably contains a structural building component that we have already accounted for in estimating the cost of the building accessibility subpart. Another problem is the relatively low cost factor for the multiple handicapped group. This probably reflects the particular mix of severity levels among the handicapped that existed in the surveyed school districts at the time of the study. In short, the reader must keep all these shortcomings in mind in assessing the validity of our cost estimates.

TABLE 8 (DA 1)

SPECIAL EDUCATION EXCESS COST FACTORS BY HANDICAPPING CATEGORY

Type of Handicap	Cost Index*		Amount of Excess Cost per pupil. ($)**	
	High cost	Low cost	High cost	Low cost
Speech Impaired	1.2	1.1	$200	$100
Mentally Retarded	2.0	1.5	$1,000	$500
Learning Disabilities	2.1	1.5	$1,100	$500
Emotionally Disturbed	2.8	1.9	$1,800	$900
Crippled and Other Impaired	3.6	2.8	$2,600	$1,300
Deaf	3.5	2.2	$2,500	$1,200
Hard of Hearing	2.0	1.5	$1,000	$500
Visually handicapped	3.0	2.0	$2,000	$1,000
Deaf/Blind or other Multi Handicapped	2.7	1.8	$1,700	$800

*This is the ratio of the total cost (special education expenditure plus any regular education resources) used to educate a handicapped child to the total cost of educating a non-handicapped child.

**Derived by multiplying the quantity (cost index -1) by $1,000. $1,000 was used as an estimate of the countrywide average expenditure per pupil in regular instruction. The National Conference of State Legislatures reported that in 1975 this figure was $1,163. See their study of State Special Education Finance, p. 8.

Source: The cost index ratios are from Rossmiller, Hale and Frorich, Educational Programs for Exceptional Children: Resource Configuration and Costs. National Education Finance Project, (University of Wisconsin, 1970). The high side ratios are the median values of the ratio as across all the districts in their sample. This is considered "high" because of the probable less severe nature of the currently not served group. The low side estimates are explained in the text.

The category "learning disabilities" is a relatively new formal label for handicapped children. It is very controversial among students in the field. Many investigators assert that there is no objective way of ascertaining that a child has a "learning disability" other than to point to the results of the supposed handicap -- low grades in school relative to expectations, given the child's performance on IQ and other standardized tests. One skeptical researcher concludes that "children who fail in school but do not fit into other special education categories also may be labeled learning disabled.

COMMENT

The author noted that "in all cases the evidence on the magnitude of benefits is, at best, based on scattered data sources and studies. Some of the numbers presented are no more than reasoned guesses. The fact that certain kinds of benefits are difficult to measure (e.g. psychic benefits) does not make them any less important.

In discussing costs and Rossmiller's cost indices, the author stated that "the rather high figure they report for physically handicapped probably contains a structural building component that we have already accounted for in estimating the cost of the building accessibility subpart." A close scrutiny of the figures reported by Rossmiller does not support this contention, though a clear rebuttal is not possible. However, most of the costs of building accessibility were probably borne in the first year or two of operation of programs for the handicapped and would not appear in subsequent yearly costs.

APPENDIX EA

Ernst & Ernst. A model for the determination of the costs of special education as compared with that for general education (2 vols.) (Reading draft of report to Illinois Governor's Office of Human Resources HEW Contract No. OEH-0-72-4874). Chicago: Author, 1974.

The Ernst & Ernst study proposed to compare the costs of special education with those of general education. Before costs could be compared, however, there had to be a way to determine them in the first place. As a result, the study concentrates on a cost accounting system in general, rather than on any costing model for special education.

The first part of the report establishes the applicability and benefits of cost accounting to education. The researchers suggest a cost accounting system would be particularly important to cost-effectiveness analyses, but their purpose is to focus exclusively on cost controls. They avoid completely the qualitative aspect of educational output. Once the researchers exclude quality, only two components of output may be measured: the number of service units delivered and the price per unit. To this end, the Ernst & Ernst Student Educational Unit is created to represent a 10 minute unit of instruction. Standard costs for each type of unit can then be established either empirically or theoretically. Total (actual) costs may thereby be broken down into the standard (planned) costs and the variance from the standards. The variance can be further subdivided into the quantity variance (the difference in the number of units delivered from the planned level), the price variance (the difference in component prices from the planned level), and the capacity variance (the difference in the number of students served from the planned level).

The cost of various curricula may be determined by program, by service, or by line-item. In addition to being adaptable to the standard fiscal reporting procedures, the system can generate numerous other reports for planning and control purposes. Of particular interest to special education is the fact that state and federal reimbursement procedures would be simplified.

The report concludes with recommendations for implementing the system and a hypothetical application using an idealized, composite school district. The second volume contains sample forms and reports from the hypothetical example.

Comment

Two commonly accepted requirements of a cost accounting system are that it be relatively simple and that it be related to managerial control or decision making. This first attempt by Ernst & Ernst does not satisfy either requirement. The establishment of a "standard," an enormous undertaking in itself, would tend to serve as a negative incentive for innovation and flexibility. Teachers would be required to fill out forms whenever the actual units delivered varied from the standard. If, for example, the teacher chose to break up two 60 minute sessions of arithmetic and reading into an 80 minute session and a 40 minute session, two forms (one for each 10 minute period of difference) would have to be filled out. The forms contained in the second volume suggest that elaborate training would be required to ensure uniform reporting.

In addition to the difficulty of maintaining accurate accounts, it is not clear there are measurable benefits to costing out each type of program. The principal costs of salaries and facilities will not be affected by such arbitrary allocations of time to program areas. Furthermore, the system is only descriptive, not normative; a manager would know how much was being spent and for what, but would not know how much *should* be spent since quality does not enter into the system.

Inevitably, the problem of this cost accounting system comes back to the concept of cost in education. As long as costs are related to inputs (i.e., duration of instruction) rather than to the quality or quantity of learning, such systems cannot aid significantly in planning or control.

(Above taken from Bernstein et. al.(1976))

APPENDIX FA

Foshee, J., Garvue, R., & Newcomer, D. **A study of the effects of special programs for exceptional students upon the implementation of the Florida finance program** (2 vols.). (Conducted under contracts with the Florida Department of Education and the Department of Health and Rehabilitative Services) Tallahassee: Department of Education, 1974.

The Florida Department of Education contracted with the programs of special education and educational management of Florida State University to study the effects of Florida's 1973 school finance law. The Department of Health and Rehabilitative Services also contracted with them for a similar study of the state institutions under their jurisdiction.

Case studies of 10 school districts were conducted. Various data forms were sent to each district to supplement personal interviews by individual members of the research team. The authors caution the reader to recognize the limitations of this study for which only 3½ months of data were available. Interviews should be interpreted as the "opinion of informed persons" rather than definitive evaluations. The second volume of the study contains the case studies and the other data collected.

Although all conclusions regarding educational services must be viewed as tentative, there were some notable observations of tendencies toward:

1. More frequent use of self contained classrooms as opposed to resource rooms.
2. Increased class sizes.
3. The hiring of less certified and less experienced teachers.
4. An increasing number of referrals for diagnosis and a resulting tendency to "temporarily" place undiagnosed students in special classes.
5. A lack of funding for startup costs, experiments in innovative configurations, and support personnel.

The attitude of district personnel appears to be one of "cautious optimism" regarding the new law. The study group suggests longitudinal research to monitor the implementation of new programs and budgets stimulated by the 1973 law.

The study group also concluded that the new law would have a positive impact on the state institutions in which education programs were generally underdeveloped, underfunded, and disorganized.

(Above taken from Bernstein et. al. (1976))

APPENDIX FB

Author:	Frohreich, Lloyd E.
Title:	Costing programs for exceptional children: Dimensions and Indices.
Publisher/Journal:	Exceptional Children
Date:	April 1973.
No of pages:	8

This paper summarized the National Education Finance Project Special Study No. 2 (Rossmiller, Hale and Frohreich, 1971) which was also reviewed by the present author.

The following tables were extracted for the purpose at hand.

TABLE 1 (FB 1)

Program Costs per Pupil by Category of Exceptionality

Category of exceptional program	*Number of programs reported*	*Expenditure per pupil*			
		Lowest	*Mean*	*Median*	*Highest*
Intellectually gifted*	5	$ 548	$ 759	$ 809	$ 872
Educable mentally retarded	22	708	1.316	1.316	2.358
Trainable mentally retarded	22	562	1.532	1.627	2,657
Auditorily handicapped	18	533	2.067	2.103	4.671
Visually handicapped	17	852	2.448	2.197	9,105
Physically handicapped	15	713	2.197	2.113	4.210
Speech handicapped	21	541	794	709	1.027
Special learning disorders	20	850	1.703	1.757	2.874
Emotionally disturbed	14	804	2.510	1.683	6.982
Multiply handicapped*	4	1.339	2.013	1.941	2.830

*Discretion should be used in making inferences or in using the data presented for the intellectually gifted or multiply handicapped programs. Data for these programs were gathered from too small a sample of school districts from which to base future program and fiscal planning.

TABLE 2 (FB 2)

Expenditure Categories that Contributed the Most to Cost Differentials Between Exceptional Programs and Regular Programs

Category of exceptionality	*Expenditure categories*							
	Administration	*Teachers*	*Supplies and equipment*	*Guidance and counseling*	*Other Instructional support*[2]	*Operation and maintenance*	*Fringe benefits*	*Transportation*
Intellectually gifted	X[1]	...	...	...	...	...	...	...
Educable mentally retarded	X	X	...	...	X	X	...	X
Trainable mentally retarded	X	...	X	...	...	X	X	X
Auditorily handicapped	X	X	X	...	X	X	X	X
Visually handicapped	X	X	X	...	...	X	...	X
Physically handicapped	X	X	X	X	X	X	...	X
Speech handicapped	...	...	...	...	X	...	...	...
Special learning disorders	X	X	X	X	X	X	...	X
Emotionally disturbed	X	X	X	...	X	X	X	X
Multiply handicapped	X	X	...	...	X	X	X	X

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[1] An X designates a cost differential of more than 1.25 times between the expenditure category cost per pupil associated with an exceptional program and the expenditure category cost per pupil associated with the regular program in a majority of the programs studied.

[2] Including specialized personnel.

APPENDIX FC

Author:	Froomkin, Joseph, Endriss, J.R. and Stump, Robert W.
Title:	Estimates and projections of special target group populations in elementary and secondary public schools.
Publisher/journal	A report to the President's Commission on School Finance, Washington, D.C.
Date	1972
Eric No.	ED-058-504
No of pages	113

SUMMARY

Extra expenditures were estimated for students requiring special attention in public schools: the financially disadvantaged, the culturally different, the mentally gifted, and the handicapped including speech impaired, mentally retarded, emotionally disturbed, deaf and visually handicapped. The report was divided into five (5) parts: (1) an outline of the rationale for selecting the special populations for separate examination, (2) the problems of counting the target groups, (3) some projections of the target populations to the years 1975-76 and 1980-81, (4) the estimates of extra costs associated with different target groups, and (5) the estimates of costs that would have been incurred in 1970-71 for serving all children with special needs. Included were some conclusions about the extent to which present practices fall short of recommended standards of service. Forty tables supported and illustrated the text.

Selected extracts of this study are presented for the purpose at hand.

This study deals only with those children who are likely to attend non-residential public schools. Some children, e.g., the deaf-mute and the severely handicapped, cannot be accommodated in schools operated by local authorities.

There are twoproblems in estimating the number and level of services required by handicapped children. First, some are classified symptomatically, others by type of treatment. Thus some deaf and emotionally disturbed children are reported as such, that is, symptomatically, and others may be classified as speech handicapped, because of the type of treatment given to them. Second, no figures exist about the degree of handicap for many handicapping conditions.

While there is considerable confusion about the definition of such a "soft" handicap as speech impairment, there are fewer differences of opinion with respect to the mentally retarded. Children testing under 68 points on I.Q. tests are generally classified as mentally retarded, and one would expect their prevalence rates to be fairly constant among regions. It is possible that the areas with poor populations, such as rural areas and central cities, would show somewhat higher prevalence of mental retardation. This hypothesis is borne out by national figures from the USOE survey[1]. By contrast the figures for individual regions show wider variations, which ought to be treated with caution. We would recommend using the USOE national prevalence figures by type of district for all regions, especially since they provide an estimate consistent with independent studies of the mentally retarded for the nation as a whole (see table 20).

Our independent attempts to validate differences by region were not successful. The enumeration of retarded children differed quite erratically from state to state. The estimates of mentally retarded children were apparently influenced by state reimbursement formulas, and did not appear to be internally consistent within each region.

Projections of the target populations to the years 1975-76 and 1980-81 were arrived at by adjusting the 1968-69 incidence rates of the USOE survey (table 20) for demographic changes, namely that the proportion of high school students will be higher in 1975 and 1980 than in 1970. Additional factors were considered in the projected incidence rates of reading problems.

[1] A special tabulation of the 1969 School Staffing Survey conducted by the U.S. Dept. of Health, Education and Welfare, National Center for Educational Statistics. School principals across the nation estimated the number of students with special needs in their school.

TABLE 20 (FC 1)

ESTIMATED PREVALENCE RATES FOR SELECTED TARGET GROUPS BY REGION AND TYPE OF DISTRICT

(Percent of Total Enrollment)

Region	Reading Problems	Speech Impaired	Emotionally Disturbed	Crippled Children	Mentally Retarded	Specific Learning Disabilities	Hard-of-Hearing	Deaf	Visually Impaired	Blind	Gifted
NORTHEAST											
Central Cities	27.8	2.97	1.59	.377	2.29	1.0	0.3	0.2	1.5	0.15	3.0
Other SMSA	13.4	3.58	1.19	.416	1.53	1.0	0.3	0.2	1.5	0.15	3.0
Non-SMSA	14.0	2.59	.98	.639	2.41	1.0	0.3	0.2	1.5	0.15	3.0
NORTH CENTRAL											
Central Cities	20.2	3.41	1.59	.380	2.29	1.0	0.3	0.2	1.5	0.15	3.0
Other SMSA	13.0	4.06	1.19	.474	1.53	1.0	0.3	0.2	1.5	0.15	3.0
Non-SMSA	12.7	2.97	.98	.635	2.41	1.0	0.3	0.2	1.5	0.15	3.0
SOUTH											
Central Cities	18.9	5.48	1.59	.380	2.29	1.0	0.3	0.2	1.5	0.15	3.0
Other SMSA	17.1	5.54	1.19	.474	1.53	1.0	0.3	0.2	1.5	0.15	3.0
Non-SMSA	21.9	4.78	.98	.635	2.41	1.0	0.3	0.2	1.5	0.15	3.0
WEST											
Central Cities	16.0	2.94	1.59	.379	2.29	1.0	0.3	0.2	1.5	0.15	3.0
Other SMSA	17.4	4.50	1.19	.474	1.53	1.0	0.3	0.2	1.5	0.15	3.0
Non-SMSA	12.1	2.56	.98	.636	2.41	1.0	0.3	0.2	1.5	0.15	3.0

Source: Rates adapted from various sources. See text.

COMMENTS

The rationale for accepting the incidence rates presented in table 20 appears suspect for two reasons: (1) figures obtained from the USOE survey are based on expert opinion, that of school principals; though the authors state that these national figures are consistent with those of independent national studies, no references are given, and (2) the authors' choice of incidence rates internally consistent at the regional level and consistent across regions conflicts with the facts. Though external influences such as funding formulas may account for some of the variations, the appropriate incidence rates would still be variable unless proven to the contrary; simplicity and clarity of consistent rates are not to be assumed but proven or supported.

The section on costs was not extracted as the presentation was poorly done, and methodology of calculating cost indices was unexplained.

APPENDIX HA

AUTHOR:	Hayes, Robert B., Cober, John G. and Reynolds, Robert N.
TITLE:	Special education: Quality cost-effectiveness study.
Publisher/Journal:	Pennsylvania State Dept. of Education, Harrisburg: Bureau of Information Systems
Year:	1976
No. of pages:	74
Eric No.:	ED 132 770

SUMMARY

The cost and quality of programs for five categories of exceptionality in the state of Pennsylvania were investigated: educable mentally retarded (EMR), trainable mentally retarded (TMR), socially and emotionally distruped (SED), brain injured (BI) and physically handicapped (PH). The random sample of classes was stratified by number of pupils per category, elementary or secondary, range of costs, demography (inner-city, other metropolitan, suburban and rural). Output was measured by achievement tests, and a social maturity instrument. Quality of input was measured by a specially developed list of quality indicators. Data analysis indicated the following:

1. Special education pupils showed significant progress in basic skills and social maturity in the 1975-76 school year, with a five to seven months interval between pre and post-testing.
2. Social maturity and achievement increases with chronological age.
3. The quality of special education instruction and programs generally is good.
4. Costs of special education vary considerably within each category of exceptionality, based on 1974-75 costs.

5. Costs of special education did not consistently correlate with quality of instructional programs as measured with the total scores on the Indicators of Quality instrument.
6. Costs of special education did not consistently correlate with achievement gains, but some relationship was discernable.

The following were extracted for the purpose at hand.

TABLE HA 1. Indicators of Quality Instrument

The content of the items and the collective quality ratings for 386 special education classes on a scale of 1 (low) to 5 (high or best) were as follows:

Factor I - Instructional Process
(11 items)

Item Content	Ratings in Per Cent 1	2	3	4	5
1. Objectives are comprehensive and specific.	7	18	27	22	27
2. Individual differences are provided for.	1	6	22	35	35
3. There is individual diagnosis and prescription.	2	12	23	32	32
4. Awareness of individual capabilities is reflected in time scheduling.	2	5	45	27	21
5. Teacher skillfully gains and maintains student attention.	2	6	32	35	26
6. Each student is encouraged to participate.	2	5	26	45	24
7. Work is assigned on the basis of needs, interests and ability of each child.	2	7	36	32	23
8. Teacher adjusts techniques to needs of each student.	4	7	37	30	24
9. Teacher checks individual progress frequently.	2	7	31	33	27
10. Teacher encourages and effectively handles questions.	5	11	30	36	19
11. Teachers uses training aides effectively.	3	15	34	30	18

Factor II - Classroom Setting, Program and Services
(13 items)

Item Content	1	2	3	4	5
1. Classroom is flexible enough to allow a diversity of activities.	4	18	29	24	25
2. Classroom space is adequate.	9	13	39	21	18
3. Furniture is adequate.	4	25	37	19	19
4. Equipment is adequate.	2	16	33	27	22

Item Content	Ratings in Per Cent 1	2	3	4	5
5. Classroom includes attractive learning centers.	7	29	28	18	19
6. Adequate classroom space and appropriate facilities are provided for itinerant services.	12	17	45	10	16
7. There is a continuum of programs and services through all school ages.	3	1	18	18	61
8. Program provides for total range of exceptionality, including the multiply handicapped.	0	8	18	12	61
9. A parent education program is an integral part of special education.	14	17	38	23	9
10. Speech program is provided for all students.	6	0	10	6	77
11. Itinerant vision and hearing teachers work with kindergarten pupils.	13	1	9	6	72
12. Services of physical therapist are available for all who need them.	20	8	8	11	54
13. Public relations effort maintains community awareness and interest in special education.	18	15	24	29	14
Factor III - Administration and Instructional Support (9 items)					
1. Appropriate examination records for each child, including psychological, vision and hearing screening, are on file	1	3	20	18	58
2. Continual (cumulative growth) records of students' progress are maintained.	1	8	22	16	54
3. An educational assessment of each child indicating strengths and weaknesses in specific skill areas are on file.	10	9	11	20	50
4. Preschool screening is available.	15	4	24	19	38
5. Early and comprehensive identification of "high risk" school-age children and immediate follow-up of individual prescription and instruction are available.	18	6	24	42	10

Item Content	Ratings In Per Cent				
	1	2	3	4	5
6. The educational assignment of every special education pupil is reevaluated not less than every two years.	2	1	4	15	78
7. Supervisor provides leadership in introducing needed and beneficial program changes.	9	14	27	18	32
8. Supervisor allots time for and encourages staff/parent conferences.	2	16	26	6	50
9. Teacher shares information with special education associates and/or other staff.	2	10	25	25	39
Factor IV - Integration with Regular Classroom (5 items)					
1. Special education classes are located within regular schools or have ready access to them.	33	6	2	1	58
2. There is evidence of a systematic plan to integrate special education students into regular programs.	27	15	21	14	24
3. Special education pupils placed in regular classes are provided help by resource and/or special education teachers.	34	12	13	16	25
4. Pupils are given an opportunity to participate in social, arts, music and physical education activities with nonhandicapped pupils.	43	6	8	4	39
5. Nonhandicapped children are encouraged to accept and help special education children.	36	16	19	15	14

TABLE HA 2

Cost Categories Investigated

The five cost areas selected for the research analysis and the line budget items under each were:

1. special education administration
    - principals
    - directors of special education
    - supervisors
    - instructional advisers
    - clerical
2. instructional teachers
    - teachers
    - teacher substitutes
    - other instructional staff
3. other instructional costs
    - instructional assistant
    - contracted services
4. special education support
    - school psychologist
    - psychiatrist
    - nurses
    - clinical psychologist
    - psychiatric social worker
    - therapists
    - clerical
    - other expenses
    - contracted medical services
5. instructional materials
    - textbooks
    - audiovisuals
    - supplies
    - other items
    - other expenses--miscellaneous

Other costs included:

- contracted auditing services
- contracted legal services
- other contracted services
- staff travel

(Cont'd)

- operation and maintenance salaries
- operation and maintenance supplies
- fuel for building
- utilities
- other expenses of maintenance
- instructional equipment replacement
- noninstructional equipment replacement
- contracted services for maintenance
- employe retirement
- Social Security
- Workmen's Compensation
- employe insurance
- fire insurance
- other insurance
- rent
- other fixed charges
- supplementary feeding
- new instructional equipment
- new noninstructional equipment

TABLE HA3

Percentage Comparison of Costs by Categories of Exceptionality, 1974-75

Exceptionality:	Instruc. Salaries	Other Instruc.	Instruc. Materials	Instruc. Support	Sp.Ed. Admin.	Other Costs	Ave. Class Cost
SED-E[a]	45.7	12.2	4.3	5.0	7.0	24.9	25,908
SED-S[a]	42.8	10.1	10.3	5.4	7.2	24.2	24,755
BI-E	44.8	15.0	3.8	4.0	8.5	23.9	25,074
BI-S	47.1	15.6	7.3	3.5	6.0	20.4	21,283
PH-E	45.3	16.0	4.8	7.5	8.5	17.9	26,864
PH-S	47.6	16.7	4.2	6.8	6.7	18.0	27,065
EMR-E	60.6	1.5	4.1	5.3	6.1	22.4	18,546
EMR-S	62.8	3.5	5.4	6.5	16.6	16.6	16,911
TMR-E	40.3	18.3	4.9	4.3	7.8	24.5	26,156
TMR-S	44.1	18.0	3.6	3.8	8.7	21.9	26,175

[a] E means Elementary; S means Secondary

N.B. SED: Socially and Emotionally Disturbed
BI: Brain Injured; PH; Physically Handicapped

TABLE HA4: Per Pupil Costs (Average Daily Memebership)
by category of Exceptionality, 1974-75

	Mean per ADM	Range
SED-E	$3651	$1308 - $5679
SED-S	$3989	$2049 - $8293
BI-E	$3323	$1403 - $5353
BI-S	$2695	$1403 - $5006
PH-E	$3284	$1457 - $6775
PH-S	$3891	$2077 - $6621
EMR-E	$1914	$1041 - $2820
EMR-S	$1846	$1122 - $2819
TMR-E	$2912	$1429 - $5660
TMR-S	$2327	$1241 - $4349

N.B. This table summarized the data presented in Tables 29 and 30

TABLE HA 5

Cost Indices by Category of Exceptionality, 1974-75

Special education cost indices were developed to indicated how much more, on the average, it costs to provide special education compared to regular education. In order to obtain comparable data, costs of transportation, capital outlay and debt service were deducted from 1974-75 regular education total costs.[1] This resulted in statewide regular education ADM costs of \$951 for elementary, \$1,273 for secondary and \$1,191 for total which were used in preparing indices for IU special education costs.[2]

Special Education Costs Indices

Exceptionality	Elementary Indices	Secondary Indices	Total Indices
EMR	2.38	1.66	1.83
TMR	3.43	2.00	2.50
SED	4.45	2.87	3.41
PH	3.64	3.25	3.08
BI	3.53	1.82	2.67
S & PMR[3]	3.52	2.71	2.83
Gifted	3.32	1.58	2.10
Detention	-	2.30	2.43
Vision	8.25	4.14	6.03
Hearing	7.11	4.00	5.51
Speech	6.62	5.56	5.33

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[1] Source: Bureau of Information Systems, Division of Statistics, Calculator, Vol. 17, No. 8

[2] Source: Bureau of Information Systems, DEAS 1340

[3] S & PMR equals Severely and Profoundly Mentally Retarded

Exceptionality Codes:		
	SED	Socially and Emotionally Disturbed
	PH	Physically Handicapped
	BI	Brain Injured

COMMENT

This study attempted to define "quality" of education and relate it to costs and achievement. The Indicators of Quality instrument was based on a consensus of opinion of experts and interested parties (e.g. parents, members of advocacy groups), and therefore, has face validity only. Though the Indicator was composed of four factors, the authors only dealt with total scores. Relating the quality factors to achievement and costs might have yielding some enlightening relationships. The choice of "integration with regular classroom" as a factor underlines the importance of ideology in any concept of quality.

The presentation of this report lacks details, and supportive information which can be found in other reports. No mention is made of who administered the achievement tests. The cost statistics are suspect for two reasons: (1) the sample was stratified by range of costs; his approach is justifiable to determine the effects of low vs medium vs high costs but may distort the mean costs;[1] and (2) cost categories for a classroom differ from those for a delivery system, and method of attributing costs to particular programs and delivery systems are not mentioned. Costs per ADM (Average Daily Membership) for each delivery system in each exceptionality category should have been calculated. As matters stand, the cost statistics are of little comparative use.

[1] Mean and median costs per exceptional pupil were calculated on the data of tables 29 and 30 which presents the sample of cost data. Using the suggested figures of $951.00 per pupil for regular elementary, and $1,273.00 per pupil for regular secondary, cost indices were calculated for EMR and TMR and compared to the cost indices reported in a separate table which are presumably based on a larger sample. The results were:

	ELEMENTARY	SECONDARY
EMR		
- reported	2.38	1.66
- calculated on mean	2.01	1.45
- calculated on median	2.02	1.46
TMR		
- reported	3.43	2.00
- calculated on mean	3.06	1.83
- calculated on median	2.74	1.75

The above comparisons indicated that cost indices calculated on the sampled costs were substantially lower than the reported cost indices. It was concluded that high cost programs were under-represented in the sample.

Lastly, the conclusion that the quality of special education instruction and programs in the state of Pennsylvania are generally good was poorly supported. The indicator of Quality was insignificantly related to achievement. The desired level of achievement was never defined. The authors appear to base their judgement on the presence of achievement progress and on the increasing achievement levels with increasing chronological age, both of which would be expected of minimally effective programs.

APPENDIX JA

Jones, P. R., & Wilkerson, W. R. Special education program cost analysis. (Study conducted for Indiana Department of Public Instruction). Unpublished manuscript, Department of School Administration, Indiana University, 1972.

This study was conducted for the Indiana Department of Public Instruction in 1972 and was designed to determine whether cost differentials between regular programs and those for exceptional children in two Indiana school corporations paralleled differentials determined by the Rossmiller study conducted for the NEFP in 1970.

Data on enrollments, staff, and expenditures were analyzed. Costs that could be directly allocated to the various special programs were isolated. The costs of principals, supervisors, and some other staff categories were allocated on the basis of full time equivalents of staff according to program assignments. Overhead, transportation, capital outlay, and debt service costs were allocated on a per pupil basis regardless of type of program.

Among the findings of the study were (a) the areas of EMR, TMR, home, and hospital program costs in the two corporations approximated the ratios determined by Rossmiller and (b) differences in program approach and services can cause extreme variability in program costs.

The authors conclude with a comparison of the advantages and disadvantages of a weighted pupil approach for special education finance as compared with Indiana's present scheme. They see the primary advantage of the weighted pupil formula as being that of simplifying the funding procedure at the state level. Among the disadvantages of the weighted approach are the continued labeling of children and the penalizing of programs in low prevalence areas. Among the advantages of the current scheme are the flexibility of programing and the highly visible reimbursements (i.e., special education is not lost in the general finance scheme). The latter advantage is critical as the state moves toward implementation of mandatory special education. They cite the disadvantages of Indiana's current system as being the large amounts of paperwork at the local and state levels and the lack of full funding with the existing reimbursement basis.

Comment

The authors do not describe the state's present special education finance formula. Johns (1972) states that Indiana reimburses local districts for (a) 50% of the salaries of special class teachers; (b) 70% of the salaries of speech, hearing, and physical and occupational therapists; (c) 70% of the cost of psychological services and special education administration; and (d) 80% of approved home teaching, home telephone, and pupil transportation.

(Above taken from Bernstein et. al.(1976))

APPENDIX KA

Kakalik, J. S., Brewer, G. D., Dougharty, L. A., Fleishchauer, P. D., & Genensky, S. M. Services for handicapped youth: A program overview.

(HEW Contract No. HEW-OS-72-101) Santa Monica, CA: Rand, 1973.

This report was prepared by the Rand Corporation for the Assistant Secretary for Planning and Evaluation of the US Department of Health, Education, and Welfare. It describes current federal and state programs for the mentally and physically handicapped youth in the United States, estimates the resources devoted to various classes of handicapped youth, and identifies major problems with the present service system.

Although it was found that $5 billion was expended annually on handicapped youth by all levels of government, five major problems were found with the present delivery system:

1. Inequity—There is a marked unevenness in the accessibility to and the level of services.
2. Gaps in services—Certain critical types of services are neglected and underdeveloped, particularly the prevention service, the identification of those needing service, and the direction of referral service.
3. Insufficient knowledge—Management improvements in most programs are hampered by the lack of reliable data related to the benefits and effectiveness of programs serving handicapped youth.
4. Inadequate control—The vast system providing services to the nation's handicapped children was found to be varied, fragmented, uncoordinated, and not particularly responsive to an individual's needs.
5. Insufficient resources—Current resources devoted to handicapped youth were found to be clearly insufficient, if service to each person is the criterion. Large unmet needs exist since less than 60% of those children in need of special education services are being served.

Comment

In addition to being comprehensive in scope, this study contains a wide variety of useful federal and state data on handicapped services. It provides a broad overview of the present allocations of federal dollars to the handicapped. However, this report and its companion publication (Kakalik et al., 1974) contain little discussion of the impact funding has on special education services.

(Above taken from Bernstein et. al. (1976))

APPENDIX 1A

AUTHOR: Leaf, L.A.

TITLE: Highlights of the 54th Annual CEC International Convention

PUBLISHER/JOURNAL: Council for Exceptional Children

DATE: 1976

SUMMARY

This document summarized the more important presentations that took place at the convention. Two of the presentations were relevant to the purpose at hand.

(1) A non-categorical service delivery system for the moderately and severly handicapped
Pat Carpenter, Director of Georgia Center for Multi-handicapped, Dekalb County Public Schools, Decatur, Ga

Of particular interest was the six behavioral criteria which had to be met by an institutionalized child to be eligible for public school:

a) attending and responding behaviours.
b) cognitive behaviours (e.g. eye contact)
c) some form (if possible) of language skills
d) minimal self-care skills
e) toilet training completed
f) ability to work in small groups (maximum of five pupils)

(2) Severely and profoundly handicapped children in the public school, Yes -But
Camille Peck, Dev. of Special Education, Maryland State Dept. of Education, Baltimore, Md.

A demonstration project took place involving the integration of 27 severely and profoundly retarded children into an elementary public school. The long term goal was to serve 600 of these children in the public school system and eventually place those institutionalized back into their own homes.

These 27 pupils were not toilet trained, were non-verbal and lacked independent self-care skills. The pupils were divided into four classroom groups and the teachers attended to toileting skills, food preparation, eating skills, table manners, self-care skills, etc. Pupils generally received ont-to-one training.

Project staff and pupils were as follows:

- 3 classroom teachers
- 6 teacher aides
- 1 O.T. (regular staff)
- 1 R.T. (regular staff)
- 1 secretarial/clerical support staff
- 1 project director
- 1 home trainer
- 1 family counsellor
- 17 pupils from the Children's Centre
- 12 pupils from a state institution (3 pupils were still living in the institution, and 5 pupils lived at home).

The teachers had previously completed a university summer workshop in managing severely and profoundly retarded pupils. In the following year, the project was expanded to include another ten teachers who had also completed the workshop.

Project staff and pupils were not accepted by the regular staff who would have nothing to do with toileting and avoided integration.

The annual per pupil cost, not counting the facility and transportation was $5,000-$6,000. It was expected that 25% of the pupils would be able to return to their own homes after one year of training.

APPENDIX LB

AUTHOR: Los Angeles City Unified School District

TITLE: Special education costs

PUBLISHER/JOURNAL: Same as Author

YEAR: 1977

SUMMARY/COMMENT

Diverse materials not presented as a coherent document were obtained through correspondence. Table LB1 summarizes costs on an average daily attendance (ADA) basis. Table LB2 lists the maximum number of pupils permitted per teacher in the various pupil categories.

Average teacher salary for 1975-76 was $15,350 plus an additional approx. 17% for fringe benefits. Also, special education classes are entitled to one non-certificated aide per teacher.

Unit costs were known to increase approximately 6 to 8% per year, except for pupil transportation which averaged 15% per year.

Since costs for regular pupils were unavailable, cost indices could not be calculated.

TABLE LB 1: Special Education Per Pupil Average Daily Attendance Costs in Los Angeles City Unified School District 1975-76

PUPIL CATEGORY	TEACHING STAFF AND FACILITIES	TRANSPORTATION [b]
TMR	3263	919
EMR	2583	134
Impaired Hearing	4817	1234
Impaired Vision	4183	1234
Impaired Hearing-I [a]	3353	500 [c]
Impaired Vision-I [a]	3382	500 [c]
Aphasic	4007	1234
Impaired Speech	4468 [d]	----
Learning Disability	3848 [d]	----
Autistic	4615	2169
Deaf-Blind	11074	1234
Other Multi-handicapped	5107	1234

---

[a] Integrated and itinerant programs

[b] Transportation costs are high due to the large area covered by the school district, over 700 square miles

[c] Estimate

[d] Cost per enrollee was $262 for Impaired Speech and $1,880 for Learning Disability, indicating part-time attendance.

TABLE LB 2: Maximum Number of Pupils per Teacher in Special Education in Los Angeles City Unified School District, 1975-76

PUPIL CATEGORY	AGE RANGE 3 - 8 yrs	AGE RANGE 9 - 20 yrs
TMR	12	12
EMR	15	18
Deaf	6	8
Severely Hard of Hearing	8	10
Both Deaf & Severely Hard of Hearing	6	8
Blind	8	10
Partially Seeing	10	12
Both Blind & Partially Seeing	8	10
Aphasic	6	8
Autistic	6	6
Deaf-Blind	3	5
Other Multi-handicapped	6	8

N.B. Assumes a teachers' aide for each teacher.

APPENDIX MA

Author Marinelli, Joseph J.

Title Financing the Education of Exceptional Children.

Publisher/Journal Found in "Public Policy and the Education of Exceptional Children", edited by Frederick J. Weiutraub, Alan Abeson, Joseph Ballard, and Martin L. LaVor. Published by Council for Exceptional Children, Reston, Virginia.

DATE: 1976

NO OF PAGES: 44

SUMMARY

The stated purpose of this paper was to provide an overview of knowledge and issues in special education finance. The paper was divided into five parts. The first part examined the environmental factors affecting the financing of special education. Special attention was given to the dynamic interplay between general and special education finance. The second part explored the costs of providing programs and services for exceptional children, including types of costs and methodologies for cost analysis.

The third part examined the patterns by which funds are distributed by federal and state levels of government to agencies providing services and the effect such patterns have on programming for children. The fourth part examined the role that each level of governement plays in providing the necessary resources for special education.

The last part introduced a program-planning budgeting format. It brought together the substantive aspects of special education finance examined in earlier parts of this paper and channeled them into a process for financing special education.

Selected portions of the paper are presented for the purpose at hand:

I. Environmental Factors Affecting the Financing of Special Education.

Special education operates within the complex formal institution of education which is itself affected by the external and interdependent factors: demographic, social, legal, economic, and political. Together these factors control the amount of and manner in which resources are made available to an educational system and the manner in which they may be spent. These external factors in concert with factors internal to the educational system control the student population and needs of special education, the amount of funds made available to special education and the manner in which those funds are allocated and expended.

Demographic and Social Factors included population characteristics such as distribution and shifts, district size, declining birth rates, socio-economic composition, and social attitudes and objectives. In order to accomplish equality of educational opportunity and provide quality education, the following reforms are needed:

1. Revenue should be collected within the framework of an equitable tax structure and scarce resources should be distributed in new ways so that educational opportunity is not a function of the taxable wealth of the school district wherein the student resides.

2. State formulas for distributing school funds should recognize the differences in the educational needs of children, variations in program costs, and school district organization (economies of scale).
3. Sources of human and material waste and inefficiency should be examined so as to devise means to increase educational productivity. (In the economic sense, expenditures on education are an investment which requires the greatest possible returns).

Legal Factors. Equal educational opportunity for the exceptional child means "equal access to differing resources for differing objectives" (Weintraub & Abeson, 1973). The achievement of differing objectives for each child would require varying the amount and mix of resources directed to each child.

Economic Factors. With the predicted leveling-off of educational funds, there is a growing emphasis on effeciency and productivity. The goal becomes to maximize the returns from a given amount of resources devoted to education or its components (effectiveness or productivity), or to produce at the lowest possible cost that level of educational output which is chosen as desirable (efficiency). A parallel concern is the development of methods and subsequent research efforts to compare the relative productivity of resources devoted to the attainment of different types of educational objectives.

Mainstreaming according to the least restrictive alternative educational placement principle gives rise to a continuum of special education organizational and instructional strategies. Flexible programming presents an opportunity to examine various human and material resource configurations of the several delivery systems (e.g. regular classroom with consultation and regular classroom with resource room) in order to find the most effective and effecient ways to accomplish educational objectives established for children classified along various categories of exceptionality and degrees of severity. The evaluative technique of cost-effectiveness analysis holds some promise.

II. The Costs of Special Education

Comment: This section is included in its entirety as it summarizes most of the important recent work, both empirical and theoretical.

The costs of special education cover a broad area in the literature. In order to discuss costs one must first grasp the concept of cost. Special education costs may be structured in several ways, according to the purpose for which one determines costs. In addition, a taxonomy of special education costs permits a better visualization and understanding of levels of cost specificity. Several different approaches have been taken to determine costs.

CONCEPT OF COST

Recent interpretations of educational costs (e.g., Thomas, 1971; Haller, 1974) depart from the traditional view of costs as only "program expenditures." These recent interpretations stem from the basic economic question of how to allocate resources in scarce supply. By consuming resources in one manner, those same resources are not available for consumption in alternative ways. In short, costs may be viewed as benefits given up rather than benefits received, by choosing to use them in one manner rather than another. Benefits foregone (lost) are called opportunity costs. Some cost considerations may not entirely be monetarily estimatable.

THE STRUCTURE OF SPECIAL EDUCATION COSTS

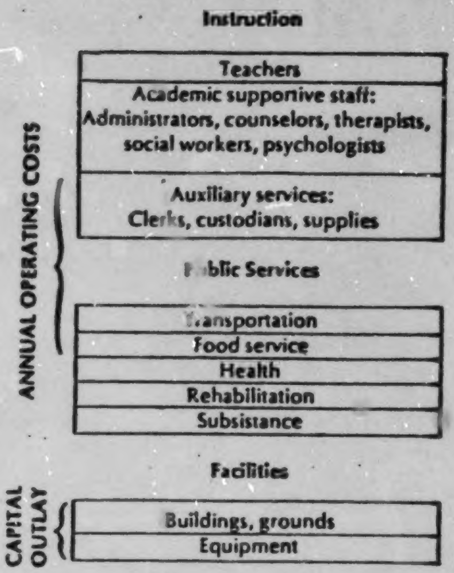
The structure of a cost model for special education should depend on the analytical purposes for which the model will be used. Its structure should reflect the complexity of what the model represents, the precision with which resource consumption is or can be known, and the decision maker's requirements for informational accuracy on questions of cost.

A Structure Sensitive to Cost Variations between Severity and Type of Exceptionality

McClure (1975) provided a cost structure for special education, the elements of which are sensitive to and reflect sources of variation in costs between the severity and type of exceptional condition (see Figure 1).

Expenditures on the severely handicapped are higher than outlays to serve students with milder handicaps. Cost categories sensitive to special education resource use will reflect the differential costs by category associated with the severity of handicapping conditions. The cost for instructional supervision will be reflected in staff-student ratios and differential costs. The degree of support staff intervention will also be demonstrated. Other unusually high costs are associated with public service categories to provide transportation, food, health, and facilities, particularly since some exceptional children require the use of special or residential facilities.

Figure 1 (MA 1)
Components of Special Education Costs



Note. From "Alternative Methods of Financing Special Education" by W.P. McClure, *Journal of Educational Finance*, 1975, 1, 42.

Total cost variations and variations by cost category may also be observed by program category (e.g., educable mentally retarded, visually handicapped, special learning disorders). It has been observed, for example, that programs for the gifted and for the speech handicapped are much less expensive than programs for the physically and auditorily handicapped child. The reasons for such variation can be obtained through cost analysis.

A Structure Sensitive to Cost Variations Between Special and Regular Education

When an assessment of program cost configurations between regular, special, and other educational programs is necessary, then a cost structure with elements common to all programs is required for comparability. Such is the case with the cost element structure provided in Figure 2. Such a structure, however, obviously is not as descriptive of the resource configuration of special services offered by special education. By using the format in Figure 2, comparisons can be made between the needs of children, types of programs designed to meet those needs, and the required level of program funding.

Figure 2 (MA 2)

Components of Special and Regular Education Costs

	Regular program cost (1)	Regular program cost per pupil [a] (2)	Special program cost by category of exceptionality (3)	Special program cost per pupil by category of exceptionality [b] (4)	Cost differential per pupil or excess cost [c] (5)	Cost index of special to regular program [d] (6)
Management Administration						
Clerical and secretarial						
Instruction Teachers						
Teacher aides						
Instructional Support Supplies and equipment						
Guidance and counseling						
Other						
Institutional Operations Operating and maintenance						
Fringe benefits						
Other						
Services Health						
Food						
Transportation Cost per pupil in ADM						
TOTAL Current operation						
Transportation Cost per pupil transported						
Capital outlay/ ADM						
Debt service/ ADM						
Teacher-pupil ratio						
Square feet of classroom space per pupil						

Note. From *Educational Programs for Exceptional Children: Resource Configurations and Costs* (National Educational Finance Project Study No. 2), by R. A. Rossmiller, J. A. Hale, and L. Frohreich, Madison: Department of Educational Administration, University of Wisconsin, 1970, p. 256.

[a] Costs of regular education divided by FTE (full time equivalency) of pupils in regular education. (FTE = 1.0 = Students assigned to program full time.)

[b] Costs of special education divided by FTE of pupils in special education.

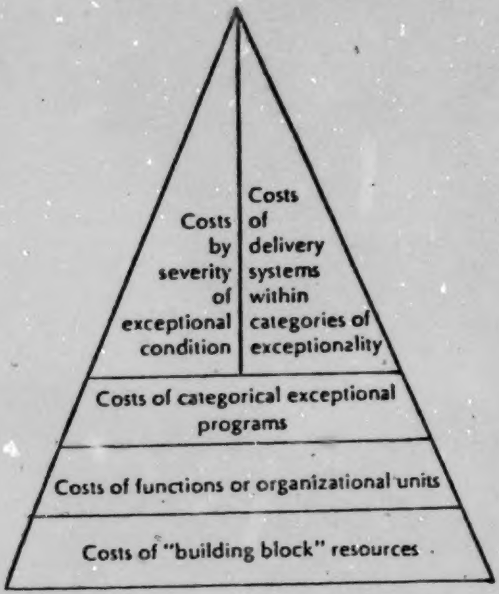
[c] Column 4 minus column 2.

[d] Column 4 divided by column 2.

A TAXONOMY OF SPECIAL EDUCATION COSTS

Perhaps the best way to visualize and understand the costs of special education is to conceptualize a taxonomy of special education costs in the form of a pyramid as in Figure 3.

Figure 3 (MA 3)
A Taxonomy of Special Education Costs


Costs by severity of exceptional condition
Costs of delivery systems within categories of exceptionality
Costs of categorical exceptional programs
Costs of functions or organizational units
Costs of "building block" resources

The costs of individual "building block" resources when mixed together comprise various functional or organizational unit costs within identifiable programs. Total program costs for each category of exceptionality are made up of functions or organizational units. Total program costs can be viewed from the perspective of a "severity of condition" classification within categories of exceptionality or by the various delivery systems that may be employed to deliver categorical programs.

Costs of "Building Block" Resources

The most finite cost categories are by the specific human and material resources consumed in program and service delivery. Haller (1974) categorized these as the "building blocks" of costs. They are time, space, equipment, and supplies.

Time refers to that period during which human resources are being expended on particular special education activities. Human resources include the time of staff, students, and volunteers. Time may be converted to dollars in the case of personnel salaries. However, salaries are not inclusive of all variations in committed personnel time required by the nature of various delivery systems. All time, whether monetary or nonmonetary, is a legitimate cost. In addition, personnel time committed to one activity is always at the expense of time committed to another activity (foregone opportunity costs). Students' time may be translated into costs for students who could be expected to be employed if they were not in school. Otherwise, time consumed during and beyond regular school hours may be measured in student instructional hours obligated by a program. As with staff time, while a student is engaged in one activity, he cannot participate or is limited in his participation in other activities. That is a legitimate cost and is referred to as foregone learning.

Space refers to the amount of use of resource rooms, offices, clinics, and other facilities consumed by a program. It may be measured in per student hour cost. Components of facility cost include interest on debentures (unpaid debt), imputed (foregone) interest on equity, depreciation (annual decrease in value), maintenance, and overhead (light, power, and heat) (Thomas, 1971).

Equipment costs should be prorated to programs over the item's expected life span. Components include imputed interest, maintenance, and depreciation (Thomas, 1971).

The cost of *supplies* can be found by adding together the annual cost of each different unit of purchase. The annual cost per unit is estimated by multiplying the number of units by the price per unit and dividing the product by the item's estimated life span in years. The average cost per pupil served by the special education program may be determined by dividing the total cost for supplies by the number of pupils.

Costs of Functional or Organizational Units

Traditionally, resource expenditure categories in school district budgets are by line-item function or organizational unit such as instruction, pupil personnel services, transportation, and food services. A cost structure may be made more detailed by listing objects within each functional or organizational category. Objects include purchased services, supplies and capital outlay, and other expenses. An object may or may not be specific enough to be considered a resource.

These functional or organizational units may not be listed under identifiable programs, but rather may include costs across all programs. In order to analyze program costs, a procedure known as a *crosswalk* is performed to separate out functional or organizational costs by exceptional program category.

Rossmiller and his associates (1970) compared special education expenditures by functional categories, as shown in Figure 2. Salaries for teachers and teacher aides, which compose the function of instruction, were the largest single expenditure. Transportation costs for the physically handicapped were very high. Orthopedically impaired children require specially equipped buses. Where transportation costs were minimal, the transportation of handicapped pupils was a parental responsibility. Instructional support was an expensive component since guidance, counseling, and rehabilitation personnel, psychologists, therapists, doctors, and nurses were widely used.

Expenditures for operation and maintenance were directly related to class size. Since special education classes used regular classrooms, and teacher-pupil ratios were lower than for regular education, a larger square footage per child existed which increased operations and maintenance costs per exceptional child.

In a related study, Bentley (1970) found that expenditures on administration, fringe benefits, instructional supplies and equipment, operation and maintenance, supportive services, teachers, teacher aides, and transportation all contributed significantly to cost differentials in functional categories between special and regular education. Only expenditures for clerical and secretarial and food services did not seem to make a difference. There were great variances between school districts in the degree to which categories contributed to the differential, however.

Clemmons (1974), in a study of six Minnesota school districts, obtained similar results to Rossmiller and Bentley. He also found that noncertified staff salary benefits and salaries of other noncertified personnel did not contribute to the cost differential.

Costs of Categorical Exceptional Programs

A preponderance of research into the costs of special education has focused on examining expenditures by categorical program. In 1970, Rossmiller, Hale, and Frohreich conducted a National Educational Finance Project (NEFP) special study. The study sought to determine cost differentials associated with educational programs for the various categories of exceptional children relative to the costs of the regular school program provided for normal children. The determination of relative costs and cost indices was based on the current practice of states and their local districts regarded by authorities in special education as leading in the provision of educational programs for exceptional children.

With every exceptionality, the median per pupil costs exceeded those for regular education. Thus the education of exceptional children involves excess costs in varying degrees. At the time of the study, the median per pupil expenditure across all districts was $655. The total per pupil costs and excess costs for various exceptionalities are shown in Table 3.

Table 3 (MA 4)

Per Pupil and Excess Costs by Exceptionality

Category of exceptionality	*Annual per pupil expenditure*	*Excess cost (cost differential)*
Gifted	$ 809	$ 154
Educable mentally retarded	1,316	661
Trainable mentally retarded	1,627	972
Auditorily handicapped	2,103	1,448
Visually handicapped	2,197	1,542
Physically handicapped	2,113	1,458
Speech handicapped	799	144
Special learning disorders and neurological handicaps	1,757	1,102
Emotionally disturbed	1,683	1,028
Multiply handicapped	1,941	1,286

. . A cost index is the ratio of average per pupil expenditure for children in a category of exceptionality to the average per pupil expenditure for children in a basic regular elementary program. Cost data were gathered within each district by specific educational programs for a given category of exceptionality and by programs for normal children. In order to provide comparable data, a uniform program cost and element format was developed which required the reconstruction of district cost data. It was suggested that the median cost index be used as the soundest basis for fiscal planning and forecasting, for it tends to reflect what might be termed average practice in that set of districts. The median cost index ranged from 1.14 for programs for the intellectually gifted to 3.64 for programs for the physically handicapped. At the time of the NEFP study, most districts were operating self contained programs.

Other studies have been conducted, most of which have used the NEFP methodology, and tend to support its relative cost findings (see Table 4).

The Costs of Delivery Systems

The placement of exceptional children into the least restrictive environment requires the availability of a continuum of services. The educational placements of these children is a function of the type and severity of handicapping condition as conceptualized in the framework by Reynolds shown in Figure 4.

With the trend now toward the mainstreaming of handicapped children, it would be advantageous to determine the differential cost of various delivery systems used within an identified category of exceptionality as shown in Figure 4. The resultant cost determinations would

Table 4 (MA 5)

A Comparison of Cost Indices

	Study and States Involved					
Category of Exceptionality	*Rossmiller et al.[a] (Wis., Fla., Ca[illegible]., Texas, and N.Y.)*	*Jones and Wilkerson[b] (Indiana)*	*Sorenson[c] (Illinois)*	*Snell[d] (Indiana)*	*Clemmons[e] (Minnesota)*	*Texas Education Agency[f] (Texas)*
Gifted	1.14					
Educable mentally retarded	1.87	1.63	1.72	1.94	1.71	2.83
Trainable mentally retarded	2.10	1.79	2.31	1.81	2.03	2.22
Auditorily handicapped	2.99	3.71	2.35 (hard of hearing) 2.41 (deaf)	1.55	2.99	3.48
Visually handicapped	2.97	6.01	2.75		2.34	4.38
Speech handicapped	1.18	1.19		1.22	1.27	5.97
Physically handicapped	3.64	2.76	2.94	4.18	2.89	2.39
Special learning disorders	2.16	2.38	2.02	1.32	1.75	2.76
Emotionally disturbed	2.83	3.73	3.95			2.61
Multiply handicapped	2.73	2.93	3.38			
Homebound/Hospitalized	1.42	1.74		1.56	1.22	
Pregnant students						1.29
Minimally brain injured						2.94

[a] Rossmiller, R. A., Hale, A., & Frohreich, L. E. *Educational Programs for Exceptional Children: Resource Configurations and Costs* (National Educational Finance Project Study No. 2). Madison: University of Wisconsin, 1970.

[b] Jones, P. R., & Wilkerson, W. R. *Special Education Program Cost Analysis.* Bloomington: Department of School Administration, Indiana University, 1972.

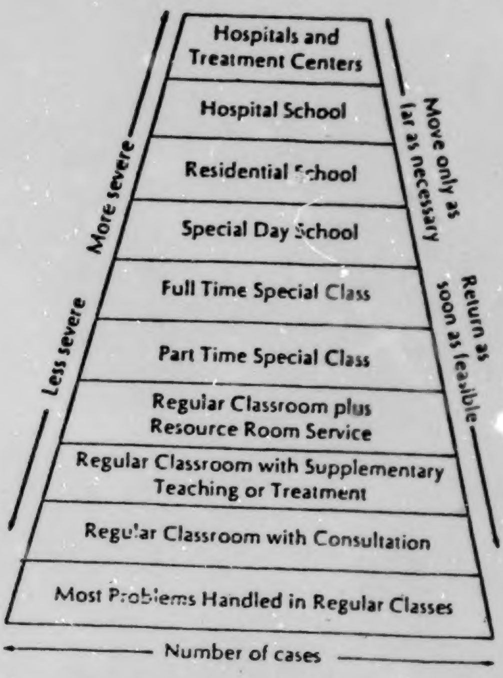
[c] Sorenson, F. W. *A Cost Analysis of Selected Public School Special Education Systems in Illinois.* Springfield, IL.: Office of the Superintendent of Public Instruction, 1973.

[d] Snell, D. E. *Special Education Program Cost Analysis for Three Selected School Corporations in Indiana.* Unpublished doctoral dissertation, Indiana University, 1973.

[e] Clemmons, A. L. *An Assessment of Cost Variations in Selected Exemplary Special Education Programs in Six Selected Minnesota School Districts.* Unpublished doctoral dissertation, University of New Mexico, 1974.

[f] School Finance-Special Projects Section, Office of the Commissioner of Education, Texas Education Agency. *Educational Program Cost Differentials in Texas* (Prepared for the Governors Office of Educational Research and Planning). Austin: Texas Education Agency, 1975.

Figure 4 (MA 6)
A Framework for Considering Some Issues in Special Education


Hospitals and Treatment Centers
Hospital School
Residential School
Special Day School
Full Time Special Class
Part Time Special Class
Regular Classroom plus Resource Room Service
Regular Classroom with Supplementary Teaching or Treatment
Regular Classroom with Consultation
Most Problems Handled in Regular Classes
More severe
Less severe
Move only as far as necessary
Return as soon as feasible
Number of cases

Note. From "A Framework for Considering Some Issues in Special Education" by M.C. Reynolds, *Exceptional Children*, 1962, *28*, 367–370. Copyright 1962 by The Council for Exceptional Children.

have implications for more effective financial planning and distribution of funds.

Clemmons (1974) calculated median per pupil costs and cost indices according to different delivery systems within categories of exceptionality in six Minnesota school districts. Median delivery system indices across all exceptionalities were: (a) regular classroom with special consultant, 1.86; (b) regular classroom with itinerant teacher, 1.50; (c) regular classroom with resource room, 2.00; (d) part time special education classroom, 1.66; (e) self contained classroom, 1.67; and (f) homebound or hospitalized instruction, 1.34.

Costs by Severity of Exceptional Condition

McClure, Burnham, and Henderson (1975) analyzed operating instructional expenditures in 23 cooperating school districts. They found that wide variations in cost differentials existed within districts for the same categorical program for exceptional children. They concluded that "the wide variations in cost differentials reflect the variations in severity of handicap among pupils of every category except the most extreme cases" (p. 15). Expenditures on the severely handicapped are higher than outlays to serve students with milder handicaps, because they require greater supervision. This is reflected in the lower staff-student ratio and higher costs. They also require greater intervention of support staff. Other unusually high costs are associated with public service categories to provide transportation, food, health, and facilities, since the severely handicapped require the use of special or residential facilities to a greater extent than children with mild exceptionalities who will be appropriately using services available to nonhandicapped pupils almost entirely.

METHODOLOGY FOR DETERMINING COSTS

Studies of the costs of special education, for the purpose of forecasting financing need, have relied on a determination of excess cost estimates and cost indices based on the best known practice of exemplary programs. A recent approach suggests that financial need should be projected on the basis of educational need. One organization has proposed the use of a cost accounting model to compare special and regular education costs and planned and actual expenses.

Excess Costs and Cost Indices Based on Current Best Practice

Since 1970, when the National Educational Finance Project special study on the costs of programs for exceptional children was published (Rossmiller et al., 1970), several studies have, for the most part, replicated its procedures (Jones & Wilkerson, 1972; Snell, 1973; Texas Education Agency, 1975; Sorenson, 1973; Clemmons, 1974).

In these studies exemplary districts were chosen, by reputation nationwide or statewide or from demographic strata within a state, as representing the current best practice. In most cases the costs of special education are contained in traditional line-item expenditure categories of school district budgets. Consequently, the costs of special education must be isolated and transferred to a uniform program cost and element format. Some costs, unlike most instructional costs, cannot be directly charged to special education—costs such as transportation, capital outlay, and debt service. These costs are usually apportioned to special education on a per pupil basis.

In these studies special education costs have been compared to regular education costs per full time equivalent student. Cost indices were then calculated dividing the per pupil costs for a category of exceptionality by the per pupil costs for a basic regular elementary education program. The excess cost of exceptional child programs is the cost differential between special and regular education programs.

Studies of this nature have laid the groundwork for more definitive studies. The limitations that are inherent in them should be recognized (Rossmiller & Moran, 1973). The costs of special education programs represented the "current" best practice at one point in time and not necessarily desirable practice or the practice of districts selected on some predetermined criteria of quality. Actual costs are a function of level of funding rather than need. Most programs were not distinguished by the delivery system or systems employed within categories of exceptionality which appear to cause great variation in costs.

Most studies encountered noncomparable and unavailable data. Precision is lost when cost data must be (a) reconstructed to fit into a uniform program cost and element structure, (b) allocated or prorated to any number of programs, (c) guessed at, or (d) estimated by more than one person or one team of people working together. Descriptions of programs and criteria for eligibility vary among school governmental units. In mainstreamed programs there is the problem of parceling out the time and resources devoted to special educational services. While statewide generated cost indices may be important predictors of costs for statewide planning purposes, they represent averages and do not reflect local conditions which should be considered when allocating funds to local districts within a state. A cost index may mask inefficient programs. Costs will differ between districts for identical programs due to differences in pupil-teacher ratios, the number of students needed to operate at maximum efficiency, and the cost per unit of purchased professional personnel and other resources.

A question arises as to the exactness of the required cost determinations. If all handicapped children are to be educated in their least restrictive environment, then in order to determine costs accurately in the professional accounting sense, it would require observing and recording the resource consumption of each individual exceptional child. Adding to the problem of accounting is the trend away from the conventional classroom toward individualized student programs containing any number of student grouping patterns and differentiated staffs, that is, a flexible delivery system. This implies resource consumption that is different for each student. Under such conditions, obtaining approximate local costs may be sufficient for state planning and fiscal distribution purposes.

Several points should be kept in mind when investigating differential costs. It may be wise to select school districts or programs on the basis of a predetermined standard of operation to avoid the inclusion of inefficient regular and exceptional programs. Programs that are starting up should be distinguished from those that are ongoing, since the costs of implementation can greatly increase annual costs. In order to ensure that cost data are collected uniformly and comparably, a single individual or team of individuals should make value judgments when transforming the district's traditional line-item budget or program budget format to the common program budget. The manner in which indirect costs are charged against regular and special programs can have a significant effect on the amount of excess cost and, subsequently, the size of the cost indices. The costs of preschool programs for handicapped children should be estimated, since many states have directed local districts to operate such programs.

An Excess Cost Approach Based on Need

The Council for Exceptional Children convened the Airlie House Conference in 1973 in response to the growing interest in the use of the excess cost approach to reimbursing school districts and the growing awareness that no really precise concept exists of what constitutes excess cost. A step by step method was developed (Taylor, 1973) for determining excess school level costs by delivery systems within categories of exceptionality:

1. A program delivery system model is identified as a basis for special education programing.
2. A set of incidence figures is adopted.
3. Using school census data and incidence figures, the number of exceptional children is determined by category of exceptionality.

4. The percentage of children with each type of exceptionality who should be served by each delivery system is estimated.
5. By applying the percentages obtained in step 4, the actual number of children to be served by each delivery system is determined.
6. Appropriate pupil-teacher ratios for each delivery system within each category are established.
7. Criteria for determining costs are established for each delivery system and each category of exceptionality.
   a. For programs which offer special education services as supplements to regular education, such as regular classroom with special consultation to the teacher, regular classroom with itinerant teacher, and regular classroom with resource room, the additional (incremental) costs of supplementary services—primarily the costs of personnel, travel, educational supplies, and materials—are established.
   b. For programs which offer special education services as substitutes for regular education in the regular school building, such as part time or full time special education, the total cost of serving handicapped children which may be expected to differ from the costs of educating regular children is established.
   c. For programs which offer special education services as substitutes for regular education outside the regular school building, such as special day school, homebound instruction, residential school, or hospital, the total costs of serving handicapped children are established.

   It must be remembered that costs established in (a) and (b) are partial costs. They do not include any prorations or allocations of joint costs, that is, those shared jointly between special and regular education such as operation and maintenance of buildings, principal's salary, and so forth.

   In order to estimate systemwide costs of the total special education program, there must be added both administrative and program cost items such as the salary of the district director and supervisors of special education, curriculum research, systemwide instructional services, and so forth.
8. Regular education costs are compared to the costs of special education programs by the following process:
   a. Obtain a school district's present operating budget.
   b. Determine present 7a, 7b, and 7c costs included in (a) and also systemwide special education costs included in (a).
   c. Subtract (b) from (a) to give "base regular costs."
   d. Calculate the replacement costs for (b) programs as follows:
      (1) Divide the base regular costs by the number of children enrolled in regular education plus the number of exceptional children enrolled in regular classrooms (equals per pupil cost of regular education).
      (2) Multiply (1) above by the number of children enrolled in part time or full time special classes. This gives the "replacement cost" for these children, that is, the cost of educating them if they were not special.
   e. Add the replacement costs for pupils in part or full time programs to the base regular costs (c) to give the adjusted base regular costs, that is, the costs of providing service to all children if they did not require any special education services.
   f. Adjust the adjusted base regular costs due to differences between the school district's actual enrollment pattern and the estimates of what the enrollment pattern should be from earlier steps.
   g. Add to (f):
      (1) The full costs of educating children outside of the regular school setting.
      (2) The supplementary costs of children receiving special assistance in the regular classroom.
      (3) The difference between part time or full time special education costs and replacement costs multiplied by those who should be in part time or full time special education programs.
      (4) Estimates of systemwide special education costs required by the pattern of special education services.

A Special Education Cost Accounting Model

Ernst and Ernst (1974) proposed a cost accounting technique which purported to be applicable to both regular and special education across all jurisdictions. The technique would allow for the analysis of variations in expenditures as a result of the differences in the units of education planned to have been delivered as compared to the units actually delivered, and/or as a result of the difference in the price estimated to be paid for a unit as compared to the actual price paid.

The Ernst and Ernst Student Educational Unit (EESEU) is the unit of service measure. It defines each unique educational activity, such as classroom instruction in mathematics, in terms of units of service. Each 10 minute period is a unit of service.

EESEU's are grouped into three activity categories: instructional, holding (supervision of the child exclusive of instruction), and service (delivery of a service to the child). The total rate for each EESEU is composed of four components of 10 minutes of costs identified as primary, secondary, tertiary, and quarternary, developed for the purpose of associating specific kinds of costs necessary to deliver each EESEU. It is recognized that different kinds of costs are assigned or allocated on varying bases.

The primary rate for each EESEU includes only the cost of the person most directly responsible for a given activity. The secondary rate includes the cost of personnel other than the primary person, books, equipment, and consumable supplies required in order to deliver a unit of service. These costs may be directly associated with an EESEU (i.e., assigned) or indirectly associated (allocated or prorated). Districtwide and school administrative costs related to the delivery of a unit of service comprise tertiary rates. Included in this group are the allocation or proration of salaries of administrative or contractual service personnel, travel, supplies, and fringe benefits. The quarternary rate component represents certain items of occupancy cost allocated and related to each EESEU. Included in this component are districtwide and school operations and maintenance expenses, contractual services, supplies, heating and utilities, depreciation, and so forth. An individual card is used to record the costs of each EESEU.

A number of subsidiary records are needed in order to develop the information required for tracing the variance from planned costs. Variances can be traced to changes in student enrollment, resource mix consumption, and price changes occurring during actual curricular operation.

The Ernst and Ernst model was not designed to take cognizance of costs as they reflect future needs. As such the system is more a management control tool than a planning aid. The cost of cost accounting both in time and money would be high, which raises a question as to the model's cost-effectiveness. The model does not recognize that if exceptional students are to be educated in their least restrictive alternative, then they will be receiving instruction in the regular classroom setting. Costs are not accounted for in this model by recording the activities of exceptional children in order to parcel out resources that these students consume. Rather, the costs are accounted for in 10 minute blocks of time without regard to the students receiving educational services. Thus, the model does not distinguish special from regular education costs.

As mentioned previously, the problem of accounting is increased by the trend away from the conventional classroom to individualizing student programs, varying student patterns daily, team teaching, and differentiated staffing. In these situations, an accounting of pupil attendance and capacity, class time, teacher time, and use of resources would be not only expensive but next to impossible. If not conducted properly it would defeat the purposes of accounting, and it may not be any more accurate than present methods for approximating differential program costs. In this model some costs are assigned, while others are allocated or prorated to an EESEU which requires an educated guess anyway.

III. Governmental Funding Patterns for Special Education

Methods of funding should complement educational program policy decisions and, therefore, should be made subsequent to those policy decisions. When funding patterns are established in advance of policy decisions, there are usually adverse effects on service alternatives, resource configurations, placement, and administrative organization; for example, the existence of only segregated special education classes. Economic incentives influence local decisions. Comprehensive planning which considers policy, goals, programming, costs, fund needs, and allocation formulas in that order are encouraged (Bernstein, Hartman, Kirst & Marshall, 1974).

Several methods of state funding to assist local educational agencies in financing programs and services for exceptional children are critically reviewed: (a) unit basis whereby the unit is defined as a set number of children assigned to a special class, (b) weighted formula on a per pupil basis, (c) percentage reimbursement at a set level of all costs incurred in providing special education programs, (d) reimbursement for personnel of a set amount of money to offset costs of all special education staff, (e) straight sum reimbursement per pupil which may vary according to the exceptional condition, and (f) excess cost formula whereby the amount by which the per pupil expenditure for exceptional children exceeds the per pupil expenditure for all other children is reimbursed (on a per pupil basis).

V. Programming, Planning, and Budgeting for Special Education

Comment: This section is included in its entirety as it describes in detail a possible approach to rationalize the decision-making process involved in financing education.

Planning, programing, and budgeting (PPB) systems have significant implications for the financial planning of special education at the local level. Among its many purposes, PPB provides a systematic procedure for (a) searching for alternative means to achieve prioritized goals and objectives for exceptional children most effectively and efficiently, (b) estimating short and long range cost projections, and (c) measuring program performance to ensure a dollar's worth of service for each dollar spent.

PPB, a concept in systems analysis, is a method which allows for the distribution of special education funds among any number of its specific programs. Programs are activities which have unique objectives. If a local educational agency does not use the PPB system, a special education department may still elect to make internal resource allocation decisions using the PPB framework. The results may then be converted into the familiar line-item format to meet local educational agency requirements.

Much of the following information has been developed from a case prepared by Graeme M. Taylor of Management Analysis Center, Inc., on behalf of the Bureau of Training, US Civil Service Commission, and the Bureau of Education for the Handicapped, US Office of Education, Department of Health, Education, and Welfare.

PLANNING

In the planning phase of PPB, studies are conducted and reports are prepared on the impact that environmental factors will have on policy implications and financing of the education of exceptional children. This is followed by analyses of alternative goals and objectives for exceptional children.

Studies are conducted of demographic, social, legal, economic, and political factors. Demographic and social factors should include the distribution of the population as it alters the district's student enrollment and economies of scale. Characteristics of the population to be examined are trends in birth rate, the status of exceptional children in the area as a productive market, socioeconomic composition, and the differential needs of all exceptional children and requisite differential educational costs.

Social attitudes and objectives are a function of the social system's concept of deviance and social reforms, manifested in economic investment in the handicapped. Litigation has been a critical avenue for change. Issues such as the right of the handicapped to an education and the question of who will pay for their education in an appropriate setting have direct relation to the nature and level of funding. The concept *equalization of educational opportunity,* as interpreted by the courts and state legislatures in the form of educational finance standards, also impacts upon financial planning.

Obviously economic factors play a major role in financial projections. Some of the economic considerations in the planning phase of PPB include the level of interest in the economic aspects of education in general and special education in particular, the public's desire for efficiency and productivity in school operations, the effect on education of general conditions in the economy, and the federal, state, and local partnership in sharing the expenses of educating exceptional children. The nature and level of governmental funding for special education will depend on the relationship between general and special education finance, the objectives of recent state finance reforms, criteria used for special education funding, and methods of funding.

The political process allocates scarce resources. Demographic, social, legal, and economic factors are screened through the political process. This information is used by lawmakers to legitimize their actions. Thus the nature and strength of interest groups who provide information and political support or opposition, and the disposition of lawmakers, are significant political factors.

From the studies, reports, and analyses, projections can be made of government revenues and budgets as fiscal constraints on agency plans. A multiple year plan is then developed for achieving goals or objectives.

PROGRAMING

The programing aspect of PPB involves several steps. The first step is the development of a program structure for analytical purposes. The structure organizes programs together with similar objectives. Major policy issues are then identified. Subsequent to issue development is program evaluation which provides cost, output, and social impact data.

The cost structure should depend on the analytical purposes for which such a model will be used; that is, sensitive to cost variations between delivery system and severity and type of exceptionality, or sensitive to cost variations between special and regular education. The costs of each exceptional program—its functions (activities), organizational units, or individual resources—can be analyzed. The magnitude of costs can be linked to the severity of exceptional condition or to different delivery systems which are employed within categories of exceptionality.

Any one of several techniques can be employed for determining special education costs. An excess cost approach may be employed which is based on (a) the current best practice of programs within the jurisdiction of a local educational agency, (b) a step by step documentation of need for each potentially employable type of delivery system, or (c) an accounting model.

The last aspect of programing is the bringing together of all data relative to the major policy issue in a summary of the analysis and recommendations for broad program decisions.

BUDGETING

Budgeting involves the preparation and submission of program budget requests of the department of special education, along with program justification. The department's budget request is reviewed along with those of other organizational units. A school district budget and its justification is prepared and presented to the school board for its review, amendments, and/or approval. The approved budgets of all organizational units including special education are tracked by the actual performance in reaching planned objectives.

DOCUMENTING PPB

PPB requires documentation for strategic decisions recommended for the budget year. The document, known as a program memorandum, includes a statement of specified major program issues, a comparison of the cost and effectiveness of alternatives for resolving those issues in relation to objectives, and special education departmental recommendations on programs to be carried out and the reasons for those decisions.

Special analytical studies are components of the entire process, and their results become part of the program memorandum to justify recommendations. Some studies can be initiated and completed in one year, while others continue over several budget years and provide improved data.

While program memorandums deal primarily with the resolution of specified program issues, a program and financial plan is the basic planning document for special education. It contains a summary of departmental programs extending over several years and a continuing record of program outputs, costs, and financing needs. In a sense, the program and financial plan serves as the vehicle for summarizing all program recommendations for budget reviews.

Traditionally, budget figures are grouped by "line items" or "objects of expenditures," such as personnel services, travel, and supplies. When using a PPB system, however, a program structure groups budgetary information according to objectives and goals. Activities are grouped which have common objectives or outputs. There are three levels of classifications and requisite criteria: program categories, program subcategories, and program elements.

Program categories. The categories in a program structure should provide a suitable framework for considering and resolving major questions of mission and scale of operations which are a proper subject for decision at higher levels of management within a local educational agency; for example: Improvement of Curriculum and Instruction in Local Schools.

Program subcategories. Subcategories should provide a meaningful substantive breakdown of program categories and should group program elements producing outputs which have a high degree of similarity; for example: Improvement of Education for the Exceptional Child (This program subcategory is assigned to the department of special education).

Program elements. A program element covers special education departmental activities related directly to the production of discrete output or a group of related outputs which are departmental responsibility. Departmental activities which contribute directly to the output should be included in the program element, even though they may be financed from different appropriations or conducted within other school district departments or by other school districts, government agencies, or private schools serving exceptional children. An example of a program element might be: Education of Emotionally Disturbed.

A program element is tied to an end product which is measurable. The output should not be an intermediate product that supports another element. It should be expected that by increasing the amount of resources (costs) of a program element, the level of output will increase.

Treatment of Support and Indirect Activities

It is suggested that the costs of support and indirect activities not be arbitrarily allocated to a program structure simply to distribute all costs. The activities of supervisors of special education and other support personnel are allocated to several program elements on a justifiable basis unless 100% of their time is spent in one program element. If no justifiable basis exists or if the allocation does not contribute to more effective decision making in budget review, a separate element should reflect these activities.

Adaptation of Program Structure to Decision Making Needs

Where services are provided to a specific target group of exceptional students that is an important focus of decision making, it will be wise to consider establishing a unique program element within a subcategory and category predominantly involved, unless significant distortions of other components of the program structure will occur. If specific overhead, administrative, or support activities are significant in and of themselves, but when distributed among program elements do not affect decisions with respect to those elements, then no allocation should occur. Small appropriations should be totally allocated to that element into which the costs predominantly occur to avoid the excessive fragmentation of appropriations and organizations, again unless decision making would be altered due to that determination.

DESIGNING THE PROGRAM STRUCTURE

The program structure integrates budgetary information by common objectives or outputs. Several steps are undertaken to design a program structure, and several alternative structures are available as examples.

Steps in Design

Generally the school district has developed a statement of broad goals and objectives, which serves as the title of the program categories of the program structure, and has chosen the number of structural levels. The first task for personnel of a special education department is to choose the number of subordinate levels. It is suggested that more than four levels may create more detail than is necessary for planning purposes. The statement of mission oriented objectives (rather than process objectives) required for program structure design should be convertible into objectives which are analytically based and measurable.

After a structure of objectives and subobjectives is established, activities which contribute to each subobjective are grouped. Each activity is usually a program element. The scope, coverage, and content of each component is clarified by attaching labels and descriptive statements for each structural component. The steps do not necessarily have to be performed sequentially. For instance, tentative descriptive statements may assist in grouping activities (elements), or a schedule of activity statements may help to formulate precise statements of objectives.

Since an objective may be subdivided along several structural dimensions, the dimension which is of primary concern in allocation of resource decisions should prevail. Subcategory classifications can be structured by distinguishing complementary from competing programs. Competing programs are alternative means of achieving an objective and compete for scarce resources, whereas complementary programs are closely related since an increase in the activities of one leads to an increase in the activities of the other.

Examples of Alternative Structures

Several alternative dimensions exist for designing a special education program structure and collecting all costs: by exceptionality, by age group, by decentralized administrative areas of the school district, by fund source, by program function, by broad objectives, or by delivery systems.

Category of exceptionality

1. Blind and visually handicapped
2. Deaf and hard of hearing
3. Speech impaired
4. Orthopedically handicapped
5. Emotionally disturbed
6. Educable mentally retarded
7. Trainable mentally retarded
8. Special learning disabled
9. Multiply handicapped
10. Gifted
11. Homebound and hospitalized
12. Administration of the department of special education (refers to general administrative costs which are best identified with a central administrative unit for all the above areas)

Age of children being served

1. Preschool
2. Elementary
3. Secondary
4. Vocational education and rehabilitation
5. Administration of the department of special education

Decentralized administrative areas of the school districts

1. Northeast area
2. North central area
3. Northwest area
4. Southeast area
5. South central area
6. Southwest area
7. Administration of the department of special education at the district level

Program functions

1. Identification, screening and diagnosis
2. Educational planning and placement
3. Individual instructional services
4. Homebound instruction
5. Tuition at private institutions
6. Transportation
7. Meals
8. Teacher training and certification
9. Medical services
10. Research and evaluation
11. Title VI projects of the Elementary and Secondary Education Act
12. Curriculum development
13. Parent education
14. Public information services
15. Physical education
16. Administration of the department of special education

Broad objectives for exceptional children

1. Promote general learning (basic skills and attitudes)
2. Promote social adjustment
3. Promote specialized (career) skills

4. Promote understanding on the part of the community
5. Remove barriers to the acceptance of the handicapped in the community
6. Administration of the department of special education

Delivery systems for exceptional children

1. Regular classroom
2. Regular classroom with consultation
3. Regular classroom with supplementary teaching or treatment
4. Regular classroom plus resource room service
5. Part time special class
6. Full time special class
7. Special day school
8. Residential school
9. Hospital school
10. Hospitals and treatment centers

If the special education program structure is designed as part of the entire local educational agency's structure, then it may take the form shown in the following example, where only applicable program categories, program subcategories, and program elements are represented.

I. Improvement of curriculum and instruction in local schools
    A. Improvement of education for the exceptional child
        1. Education of blind and visually handicapped
        2. Education of deaf and hard of hearing
        3. Education of speech impaired
        4. Education of orthopedically handicapped
        5. Education of emotionally disturbed
        6. Education of educable mentally retarded
        7. Education of trainable mentally retarded
        8. Education of special learning disabled
        9. Education of multiply handicapped
        10. Education of the gifted
        11. Education of homebound and hospitalized
        12. Other aids for professional staff
        13. Administration of special education Title VI aids to localities
II. Improvement of educational resources for schools
    A. Improvement of teaching resources
        1. Inservice education in the education of exceptional children
    B. General financial support
        1. Foster home children tuition
III. Improvement of instructionally related supporting services
    A. Transportation aids and services
    B. Medical services
        1. Consultation and other
        2. Aids to orthopedic schools
        3. Medical and rehabilitation
        4. Handicapped administration

COORDINATING INTERAGENCY AND INTRA-AGENCY PPB ACTIVITIES

Since the special education department of a local educational agency is not the only agency or organization planning and providing education and related services, it is imperative to coordinate the district's PPB activities with those other groups. State schools for the blind and the deaf may be operated by an agency which governs hospitals and institutions. Departments of mental health and vocational rehabilitation perform research and provide counseling and other out-patient services. Private and parochial schools operate special education programs. Private institutions exist for the mentally ill. Voluntary statewide groups, such as the local chapter or state federation of The Council for Exceptional Children, and local service clubs provide numerous services. Colleges and universities offer professional preparation programs in special education. Other departments operated by the local educational agency offer programs and services to the exceptional child, such as regular curriculum and instruction, pupil personnel services, and vocational education.

Coordination can be encouraged by any one of a number of different mechanisms:

1. A strong program concept of statewide significance which will serve as a focal point for coordinated effort.
2. Legislation and school board policy.
3. Functional reorganization.
4. Creation of local and statewide advisory groups on services to exceptional children.
5. Interdepartmental and interagency coordinating committees.
6. An ad hoc task force under chairmanship of a person with coordinating authority.
7. Centers for coordination in each department.
8. Preparation of local and statewide plans for exceptional children.
9. Program coordination in the school districts by operating personnel.

APPENDIX MB

AUTHOR:	Massachusetts Department of Education Division of Special Education
TITLE:	Information on 1975-76 school year.
PUBLISHER/JOURNAL:	Same as Author
YEAR:	1977
NO. OF PAGES:	Not applicable

SUMMARY/COMMENT

This information was obtained through correspondence and does not constitute a coherent document.

Special education data is not collected on the basis of disability but by program prototype. Table displays the various programs and student enrollment. A wide spectrum of programs are offered with approximately 50% of FTEs in part-time regular programs. The "Parent-Child Instruction" Program is supplemental to other programs and consists of training and support provided to parents to enable them to participate in educating or treating their child. The Diagnostic Program applies to children for whom the regular assessment team has failed to make a conclusive assessment and set objectives for the child. With a list of specific questions to answer and recommended diagnostic procedures, the designated staff conducts the program which lasts no longer than eight (8) weeks.

Cost information was available on each program prototype but is not here presented pending clarification of the cost categories (e.g., instructional costs, tuition costs)

Some interesting cost data was available on 422 school districts which is summarized in Table MB1. The present author took this opportunity to explore the area of "economy of size". District size is given as total FTEs. Dividing special education instructional costs as a percent of total instructional costs - by the special education pupil incidence rate, TABLE MB1: Special Education Student Population of Massachusetts Department of Education by Program Prototype for 1975-76.

PROGRAM PROTOTYPE		# of students	FTE	% of total FTE
502.1	Regular day with Modifications	16,483	2,031	5.3
502.2	Regular day with no more than 25% out	94,512	13,320	34.8
502.3	Regular day with no more than 60% out	11,877	5,700	14.9
502.4	Substantially separate program	12,013	10,031	26.2
502.5	Day school program (separate school)	3,043	1,430	3.7
502.6	Residential	665.5	665.5	1.7
502.7	Home or Hospital	6,556	3,012	7.9
502.8	Parent-Child Instruction	435	435	1.1
502.9	Diagnostic Program	722	722	1.9
503.1	Career Skills	1,043	284	0.7
606.1	Pre-School (Age 3 & 4)	1,266	614	1.6
	TOTAL:	148,615	38,244.5	99.8%[a]

[a] Total not amount to 100% due to rounding.

we obtain the percent of total instructional costs accounted for by one percent (1%) of Special Education pupils. This "Economy Statistic" is more useful in comparing costs than gross costs or percent of costs because both of the latter are affected by the number of special pupils served. A study of the last column in Table MB2 indicates that, firstly, there is considerable variability in the Economy Statistic; secondly, this variability decreases as district size increases; thirdly, the Economy Statistic tends to decrease with increasing district size, that is, costs per pupil decrease with increasing district size. The data does not permit identification of the most economical district size due to its gross measure and the many uncontrolled variables. However, consistently lower values of the Economy Statistic are found for districts with total FTEs of 15,000 and more.

It may be argued that the reason the Economy Statistic decreases with increasing district size (and therefore increasing number of special education pupils) is actually due to disproportionately increasing expenditures that is, larger districts have such large instructional budgets that the relatively large sums spent on special education appear small. An answer to this question was saught by calculating the instructional cost per FTE of select districts of increasing size. The data presented in Table MB3 strongly supports a relationship between the economy statistic and instructional cost per pupil; costs increase with increasing size of the economy statistic. Alternatively, costs decrease with increasing district size.

These analyses are exploratory in nature. A follow-up with more sophisticated analysis (e.g., multiple linear regression) would be appropriate.

TABLE MB2 : Massachusetts Department of Education - Special Education Cost Statistics for 1975-76

School District	(1) Total FTE Pupil Avg. Membership (All Programs)	(2) Special Ed. Pupil Incidence Rate as % of Total FTE	(3) Special Ed Instructional Service Expenditures as % of total inst. expenditures	Economy Statistic (3) divided by (2)
Berlin	337.5	1.63	15.51	9.52
Lee	1480.0	3.48	9.80	2.82
Millbury	2628.0	4.26	8.55	2.01
Abington	3281.0	4.13	11.69	2.83
Walpole	4645.3	2.28	13.29	5.83
Falmouth	5194.0	1.65	8.00	4.85
Methuen	6674.4	1.99	9.17	4.61
Natick	7892.6	2.14	12.99	6.07
Aitlebord	8211.7	2.56	9.84	3.84
Braintree	9037.6	2.20	9.32	4.24
Medford	10,638,0	1.17	9.11	7.79
Somerville	11,990.1	3.05	10.27	3.37
Weymouth	13,540.3	2.55	9.68	3.80
Framingham	14,319.0	3.38	12.01	3.55
Fall River	15,224.0	4.85	11.97	2.47
Lynn	16,511.0	3.48	11.08	3.18
Brockton	20,967.0	2.11	8.39	3.98
Worcester	27,619.0	5.05	10.39	2.06
Springfield	28,821.0	2.99	9.72	3.25
Boston	84,676.0	6.28	13.17	2.10

N.B. These statistics (except for the last column) were extracted from an in-house report prepared by Mr. Bruce Perlstein fro financial auditing purposes.

TABLE MB3: Massachusetts Special Education Costs for 1975-76 -- Clarification of Economy Statistic

		ECONOMY STATISTIC	INSTRUCTIONAL COST PER FTE[a]
increasing district size ↓	Berlin	9.52	$ 7515
	Walpole	5.83	$ 6936
	Braintree	4.24	$ 4144
	Lynn	3.18	$ 2929
	Worcester	2.06	$ 2324
	Boston	2.10	$ 3050

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[a] Calculated on data presented in an in-house report prepared by Mr. Bruce Perlstein for financial auditing purposes.

APPENDIX MC

AUTHOR: Melichar, Joseph F.

TITLE: A program structure for evaluation and planning.

PUBLISHER/JOURNAL: Adaptive Systems Corporation
1650 S. Amphlett Blvd., Suite 317,
San Mateo, Calif. 94402

DATE: 1975

NO. OF PAGES: 151

SUMMARY

This paper was part of an effort designed to provide the Rocky Mountain Regional Resource Center (RMRRC) staff with additional training in evaluation procedures and act as a basis for program planning. The training was linked to the operational needs of the Center's existing program which had been documented in a final report by the author covering the last four years of operation.

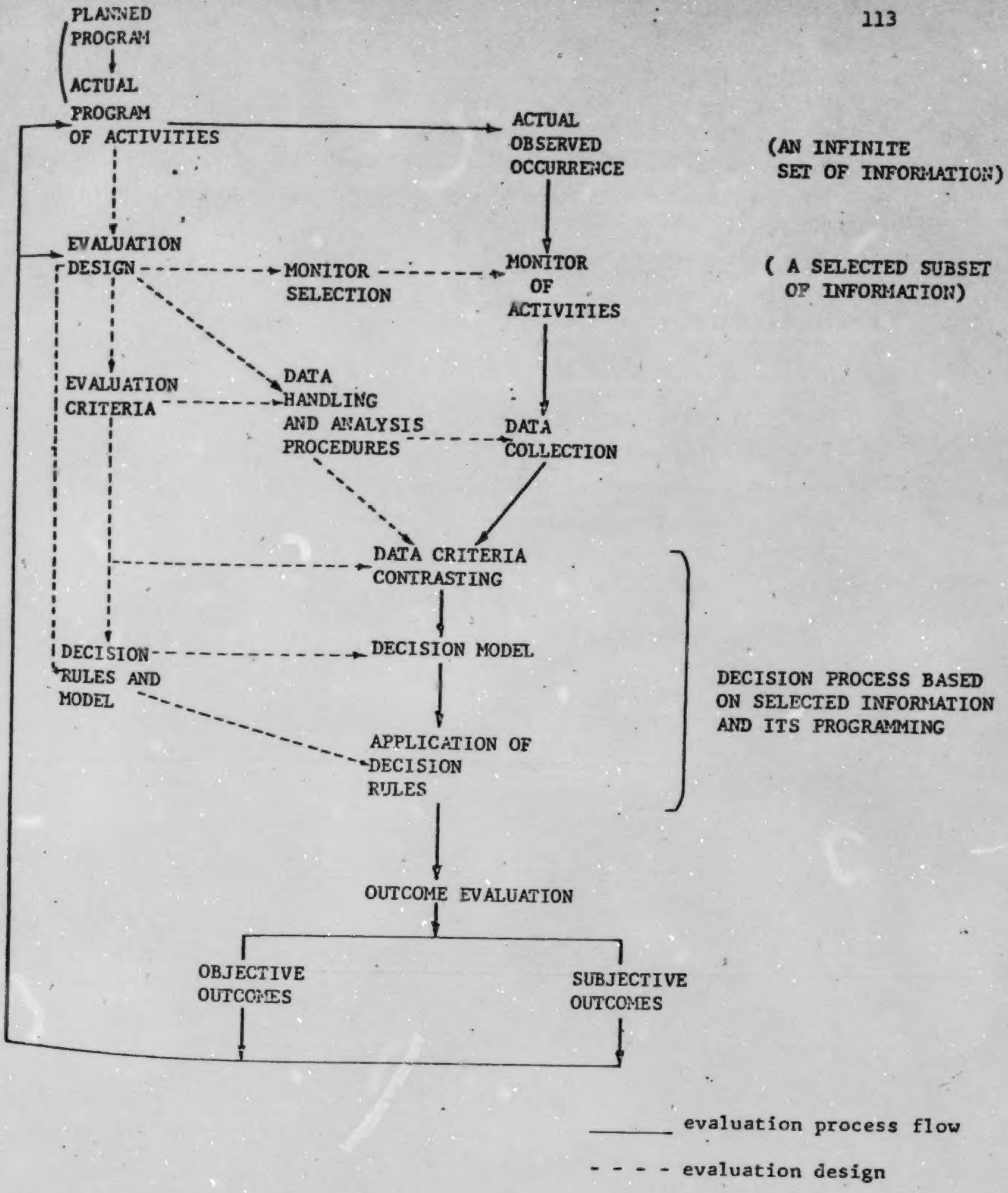
Evaluation was viewed as an iterative process which obtained answers to questions such as, What unmet needs should be met?,How best to go about it?, etc.

Adopting a "planned change agent" model, four roles for the Center were explored: catalyst, solution giver, process helper, and resource linker. The region served (States of Arizona, Colorado, New Mexico, Nevada and Utah) and target population were described as the context for evaluation. Various models were introduced to describe the operation of the center and its interaction with other organizations.

The development of the accountability framework was undertaken through a function centered view of the educational system. The procedure aligned the Center with the needs, characteristics, and structure of the educational system it serves. The service program was designed as a needs reduction mechanism, i.e., a system of directed actions towards defined goals. This type of organizational structure has an embedded evaluative feedback mechanism as part of its planning and management procedures.

The evaluative framework outlined provided a range of options in establishing an evaluative system and processes about it; the focus was on building the capacity to evaluate. The approach being suggested was to select a path, allocate resources, and establish expectancies for evaluation to insure that the procedures have utility and do not waste resources.

The following were extracted for the purpose at hand.


PLANNED PROGRAM
ACTUAL PROGRAM OF ACTIVITIES
ACTUAL OBSERVED OCCURRENCE
(AN INFINITE SET OF INFORMATION)
EVALUATION DESIGN
MONITOR SELECTION
MONITOR OF ACTIVITIES
(A SELECTED SUBSET OF INFORMATION)
EVALUATION CRITERIA
DATA HANDLING AND ANALYSIS PROCEDURES
DATA COLLECTION
DATA CRITERIA CONTRASTING
DECISION MODEL
DECISION RULES AND MODEL
APPLICATION OF DECISION RULES
DECISION PROCESS BASED ON SELECTED INFORMATION AND ITS PROGRAMMING
OUTCOME EVALUATION
OBJECTIVE OUTCOMES
SUBJECTIVE OUTCOMES
evaluation process flow
evaluation design

A GENERAL EVALUATION PROCESS MODEL
FIGURE 1.1. (MC1)

The Role of the NERRC Program

The primary goal of BEH and the programs it sponsors is to assure that all handicapped children in the nation are served with an appropriate educational program by 1980. The RRC mandate, as specified in January 1974, is to assist in the accomplishment of this goal through the undertaking of a set of specific actions; namely,

> The Regional Resource Center Program has as its goal encouraging and promoting the development and application of exemplary appraisal and educational programming practices by State and Local educational agencies.

The administrative guidelines indicate that each RRC is to help the nation work toward this goal by working with SEAs in their region to assure effective appraisal and educational program placement for all handicapped children through the provision of technical assistance and by,

> . . . demonstrations of systematic, comprehensive appraisal for handicapped children which result in children receiving appropriate, quality special educational services, and provide assistance to educational agencies in adopting such appraisal practices. A systematic comprehensive appraisal process includes
>
> 1) referral and screening
> 2) individual assessment
> 3) development of appropriate individualized educational program and placement
> 4) implementation of the educational program based upon effective communication and coordination among essential personnel, and
> 5) provision and maintenance of testing and evaluation practices to determine the effectiveness of the individual educational program and also to assure the continued appropriateness of the educational program and placement.

Implicit in the above stated role for the RRCs is the need to develop and implement procedures for sharing and extending educational resources to assure that exemplary appraisal and programming practices can and will be adopted in each region. Implicit on this statement is the implication that that major part of the role of each RRC is that of a stimulus for change within the states in the region. The stimulus is to be provided by developing a need responsive resource system such that SEAs and LEAs will find it useful to utilize the components of the systematic comprehensive appraisal process.

The RMRRC (Reference 11) selected as the basis of its operation a "planned change agent" model. Planned change is defined to mean a movement toward some specified target objectives through a sequence of selected activities. The specific change model selected is one defined by Havelock (Reference 12) which states that there are four ways or "functions," that can be used to facilitate planned change or planned innovation. Havelock relates these functions to operations by individuals; namely, these persons may function as catalysts, solution givers, process helpers, and/or resource linkers. The interactions of the user with RMRRC services through these four types of staff functions is represented graphically in Figure 1.2.

The catalyst serves to act as both a stimulus and fusion element. The stimulus activities would be focused on encouraging persons or agencies in the target region to consider new methods or to think about and work on an observed or reported problem or need. The catalyst's second function is to seek to bring elements of a service system together to better serve children, or to work on common problems. This fusion is sought to be implemented by creating situations in which persons of common interest can interact relative to a provision of a specific type of service. The catalyst in serving these functions may upset the status quo, but does not necessarily offer any solution. At the point where alternative solutions become an ingredient of the service offered, the role of the "change agent" changes to one of the following:

- A solution giver who has a definite idea or suggestion in mind to impart to the user. The primary task of the solution giver is to know when and how to offer the solution and to be able to adapt it to the user's specific situation.
- A process helper knows how change comes about in individuals and in organizations and can assist the user in the process. The process helper shows the user how to: 1) recognize and define his needs, 2) diagnose problems and set objectives, 3) acquire relevant resources, 4) select or create solutions, 5) adapt and install solutions, and 6) evaluate the solution installed.
- A resource linker who assists the user in finding and making use of resources available both inside and outside the user's system. Resources here are defined in a broad sense and include: 1) financial, 2) knowledge of solutions, 3) knowledge and skills in diagnosing problems, 4) formulating and adopting solutions, 5) expertise on the process of change, and 6) people with time, energy, and motivation to be of assistance.

N.B. SEA: STATE ED. AGENCY
IEA: INTERMEDIATE " "
LEA: LOCAL " "

FIGURE MC2 RMRRC Process Model

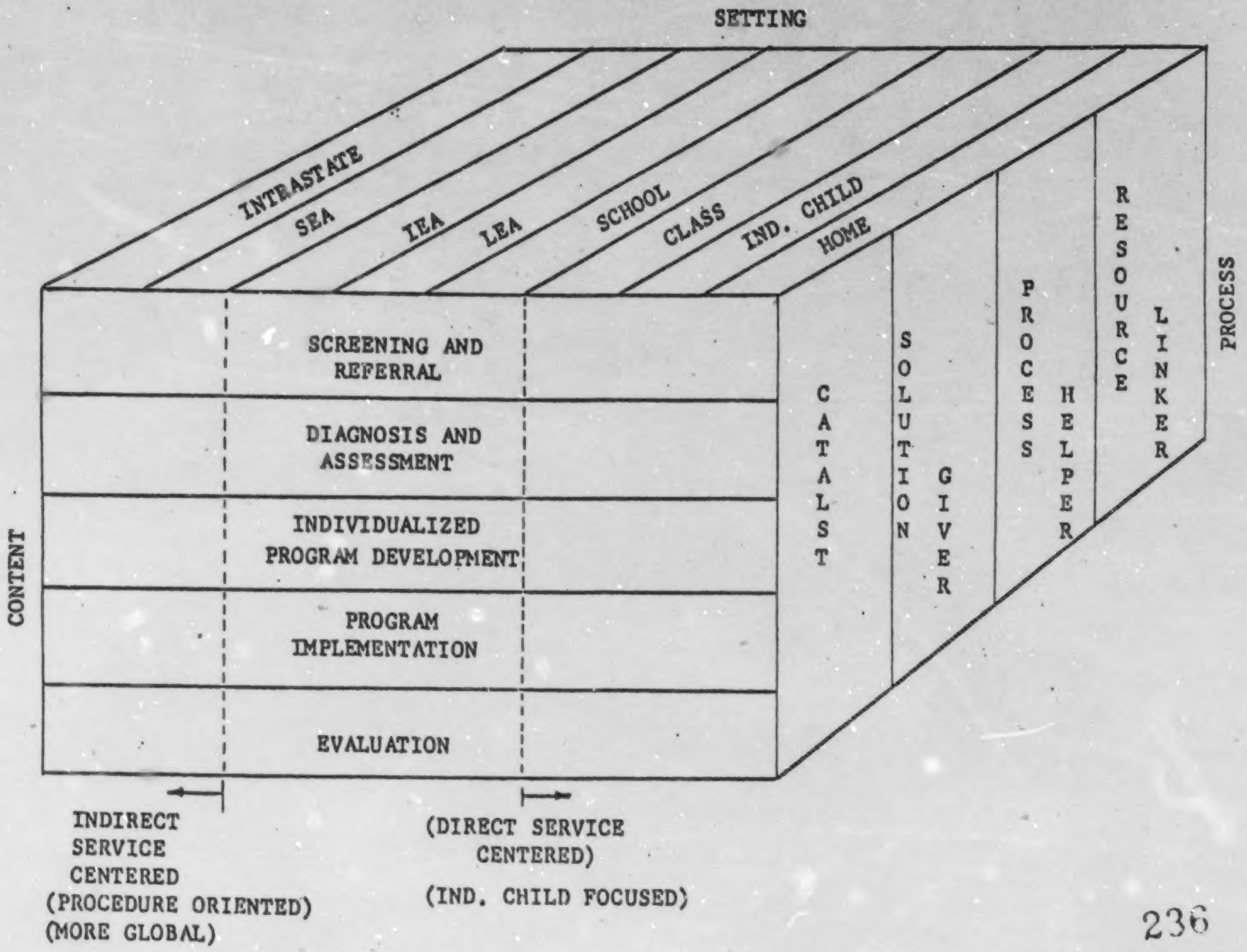
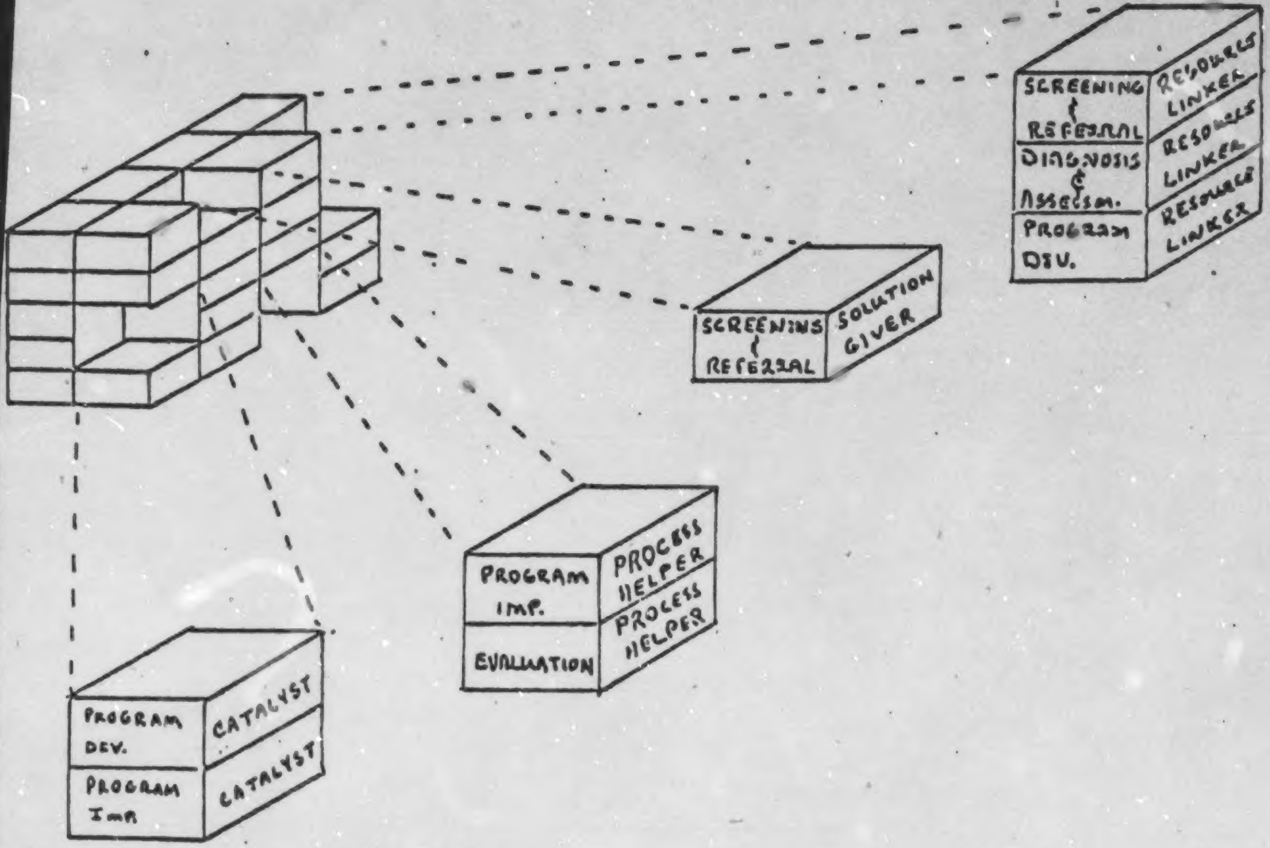

SETTING
INTRASTATE
SEA
IEA
LEA
SCHOOL
CLASS
IND. CHILD
HOME
PROCESS
CATALST
SOLUTION GIVER
PROCESS HELPER
RESOURCE LINKER
CONTENT
SCREENING AND REFERRAL
DIAGNOSIS AND ASSESSMENT
INDIVIDUALIZED PROGRAM DEVELOPMENT
PROGRAM IMPLEMENTATION
EVALUATION
INDIRECT SERVICE CENTERED
(PROCEDURE ORIENTED)
(MORE GLOBAL)
(DIRECT SERVICE CENTERED)
(IND. CHILD FOCUSED)

FIGURE MC3 RMRRC Process Model Showing Individualized Services


SCREENING & REFERRAL
RESOURCE LINKER
DIAGNOSIS & ASSESSM.
RESOURCE LINKER
PROGRAM DEV.
RESOURCE LINKER
SCREENING & REFERRAL
SOLUTION GIVER
PROGRAM IMP.
PROCESS HELPER
EVALUATION
PROCESS HELPER
PROGRAM DEV.
CATALYST
PROGRAM IMP
CATALYST

Evaluation

Six different forms of evidence will be obtained for the evaluation of the Regional Resource Center program. The different forms of evidence will have different weightings at different stages of program development. The six forms of evidence are as follows from Suchman (1967):

Effort information. This will be a description of level of effort expressed in terms of money, time, people and children. It will include such information as the numbers of children reached through the program, the amount of staff time invested by the center, the numbers of people who have visited the demonstration center, the amount of money spent on the various center activities, etc. This information will be most useful in assessing from the beginning stages of the project the level of interest expressed by the community, the participating states and others.

Performance information. This will report the extent to which children involved in the program reach the objectives set for them. The reporting will take several forms. It can be a statement of the percent of children who achieved their objectives in a given period of time. It can be a statement of the number of individual objectives the average child achieved. It can be a generalized description of the level of functioning of groups of children at any given time, with a second statement about their level of functioning at a later period. It can be a score on standardized achievement tests on a pre and post basis where appropriate. It can be the number of steps achieved on a rating scale. The progress of a child can only be assessed in terms of his individual learning program which makes it difficult to state in advance what the criteria measures will be.

Adequacy of performance. The fact that a child progresses through a number of steps in a learning program does not provide data on the quality of his achievement. It is necessary to also obtain some indication of quality of performance. This is a more difficult procedure which requires value judgments. Teachers and administrators will be asked to describe the quality of performance which they want their children to exhibit. This could well be different from school district to school district. This description of performance for each major learning step will be obtained early in the project. When it is time to obtain the evaluation, descriptions will be made of the actual performance of the children. These will be compared with the previously obtained statements. Judgments will be made by project staff and others as to whether or not the two statements match.

Cost data. It is important to know whether the initiated program costs more or less than the program previously employed. It is recognized in advance that the cost of the demonstration center will be higher because of the involvement of project staff. The important cost figures, therefore, will be derived from the outreach stations where the available resources have remained relatively constant. Cost data will be related to performance data to obtain an indication of the cost efficiency of the program.

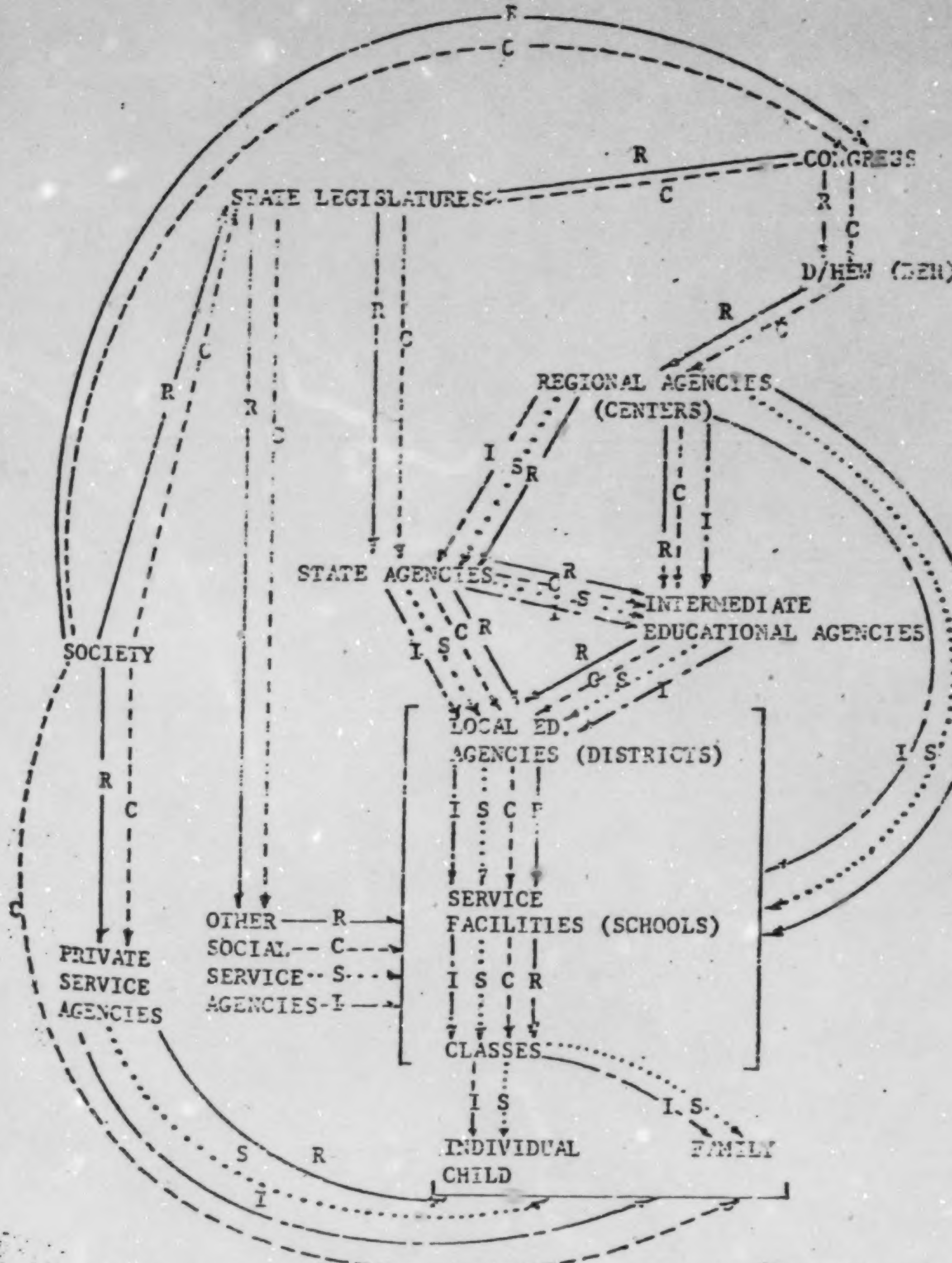
Process data. A major purpose of the program is to influence educational personnel to behave differently with respect to handicapped children. An important analysis, therefore, will relate to the extent to which educational personnel actually adopt the appraisal processes which the RMRRC proposes. The professional activities of relevant personnel will be described at the point of entry into a state center. At the end of the project, it will be determined whether or not the same personnel still continue to employ the same skills in the same way as before involvement with the program, and whether or not they are using the skills in the way promoted by resource center staff.

Value data. This form of evidence related to whether or not teachers, children, parents, and educational administrators view the program positively An important indication of success for the program will be if the consumers of services like what they see. This is important because these consumers will be the ones who will promote the program thoughout the states, advocate for funds, etc. No matter how effective the program is, if people do not like it, it will not gain general acceptance.

The RMRRC staff considers it essential to build evaluation expertise on the basis of ongoing program evaluation, utilizing the six forms of evidence presented above. Feedback intervals will be established to provide the opportunity for corrective program change. Since the current RFP limits core staff, requires demonstration projects, includes a vast region with complex and very specific minority population problems, the need to maximize impact of available monies is sharply focused. Extensive and ongoing program analysis of service delivery will be required to obtain and maintain this focus. This analysis will provide the content for staff in-service training in evaluation and the process will be conducted by a prominent evaluation specialist(s) throughout the grant period.

A conceptual model of the relationship of the RRC to the educational system in its region is graphically depicted in Figure 2.2. The model is useful in illustrating that an RRC is not an internal element of the functioning educational system. Actual services are provided through a series of relationships which reflect the flow of authority, control, resources, and information. An RRC is external agent to this flow and is derived from a separate resource/authority structure that can enter the operating educational system only by invitation.

The open avenues into the system are through focal administrative control points. The Center can alter these agencies' resource support, information, or capability to provide additional services within the constraints of its available resources and its mission. To gain acceptance the RMRRC must establish lines of communication to the key points in the educational system, and must be responsive to the needs of the educational community in order to reach the target population of handicapped children. In Section 1 it was suggested that the needs of the educational community varies in relation to its function relative to the instructional process and that RMRRC responses must be shaped accordingly.


R
C
CONGRESS
R
C
STATE LEGISLATURES
R
C
D/HEW (BEH)
R
C
R
C
R
C
R
C
REGIONAL AGENCIES
(CENTERS)
I
S
R
C
I
R
STATE AGENCIES
R
C
S
I
INTERMEDIATE
EDUCATIONAL AGENCIES
I
S
C
R
R
C
S
I
SOCIETY
LOCAL ED.
AGENCIES (DISTRICTS)
I
S
R
I
S
C
R
R
C
SERVICE
FACILITIES (SCHOOLS)
OTHER
SOCIAL
SERVICE
AGENCIES
R
C
S
I
PRIVATE
SERVICE
AGENCIES
I
S
C
R
CLASSES
I
S
I. S
S
R
I
INDIVIDUAL
CHILD
FAMILY

Note: The terms R.C.S.I are used to indicate broad processes in a general context.

(Source: ref. 4 and [illegible])

R —— RESOURCES
C ---CONTROL /AUTHOR.
S ...SERVICES
I—-—INFORMATION

Fig. 2.2. (MC 4) A MODEL OF THE RRC RELATIVE TO THE EDUCATIONAL AND SOCIAL SYSTEMS

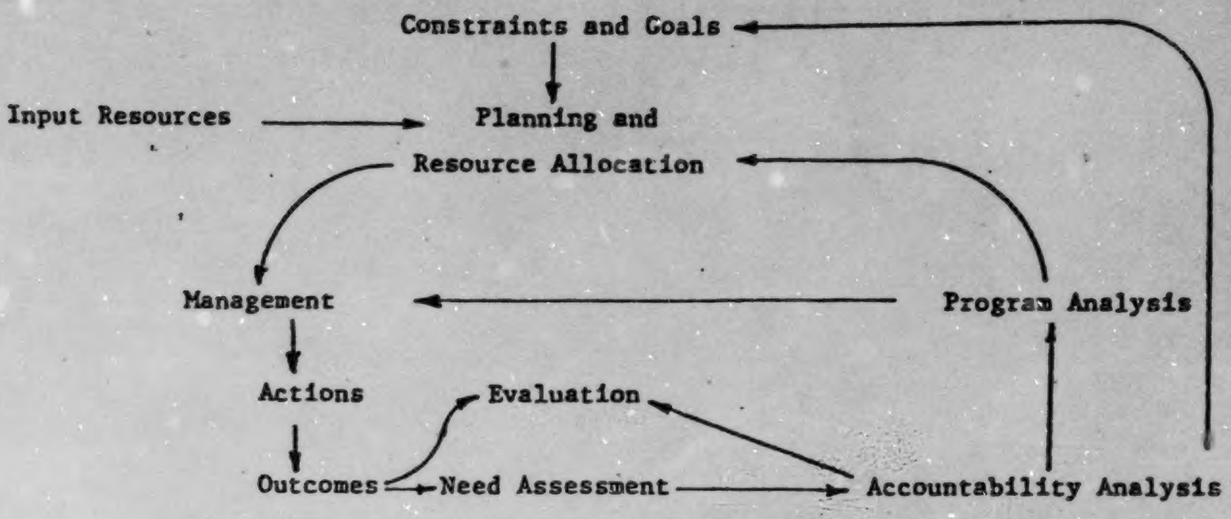

Constraints and Goals
Input Resources
Planning and
Resource Allocation
Management
Program Analysis
Actions
Evaluation
Outcomes
Need Assessment
Accountability Analysis

Figure 4.2 (MC 5)

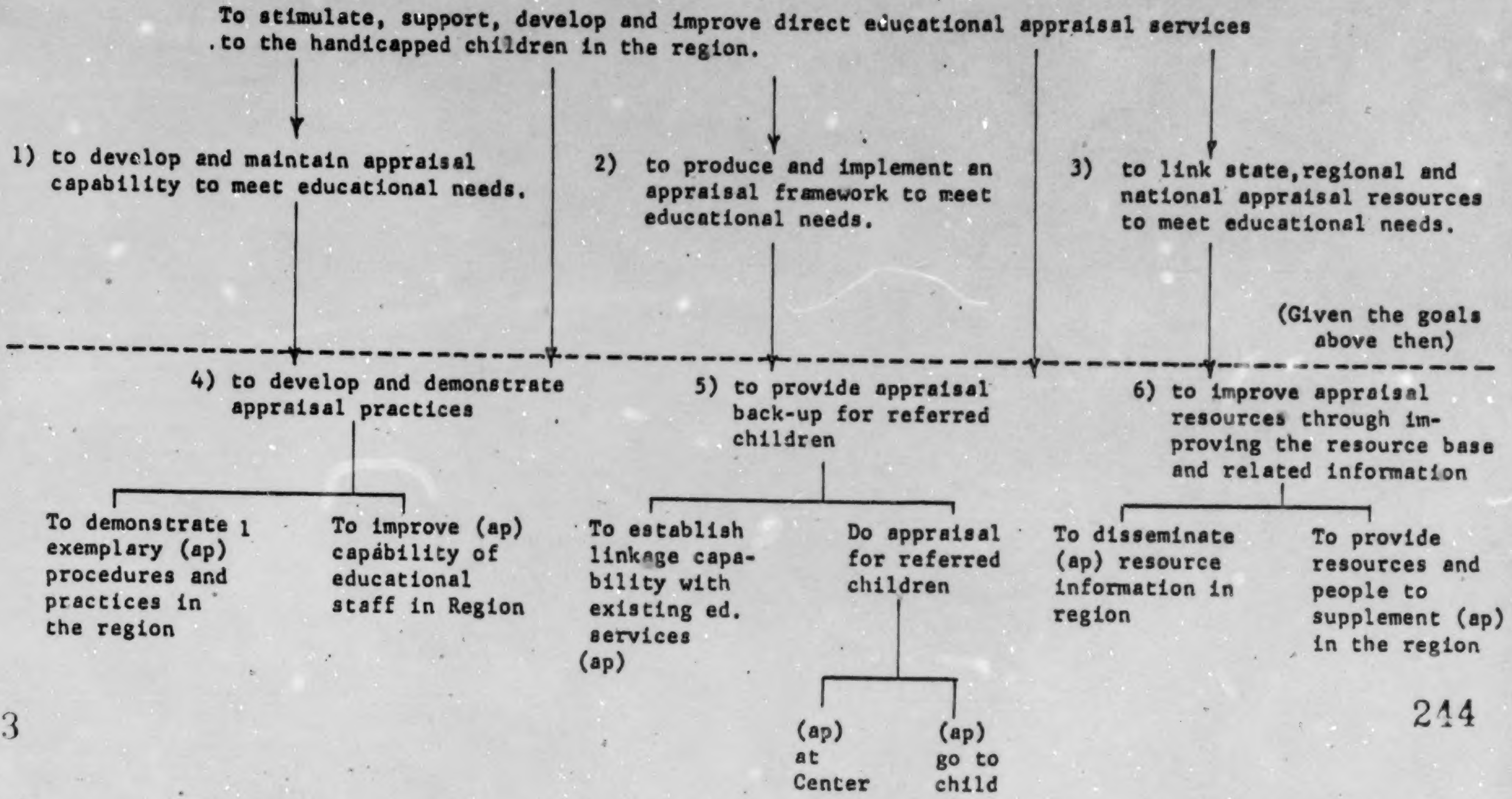
Relationship of the Management Components

cycle described in Figure 4.2. The specific steps suggested are:

1. Review this report and the existing Center organizational structure and establish a desired organizational structure.
2. Given this structure goals and objectives should be defined for each major activity area.
3. Describe the given resources (money and staff capability).
4. Describe the constraints under which the Center operates (guidelines, time frame, target population, needs, ...)
5. Establish an initial allocation of resources and priorities.
6. Establish plans for each activity (separately from item 5).
7. Form a budget and staffing for each activity.
8. Match the allocations and priorities with the plans and evaluate the discrepancies.
9. Revise allocations and priorities.
10. Based on the revised allocations define a final plan for each activity.
11. Establish time and cost milestones and a cost and management control system.
12. Define expected outcomes and evaluative measures.
13. Initiate the work.

FIGURE MC 6

INSTRUCTIONAL PROCESS DIRECTED



To stimulate, support, develop and improve direct educational appraisal services to the handicapped children in the region.

1) to develop and maintain appraisal capability to meet educational needs.

2) to produce and implement an appraisal framework to meet educational needs.

3) to link state, regional and national appraisal resources to meet educational needs.

(Given the goals above then)

4) to develop and demonstrate appraisal practices

- To demonstrate exemplary (ap) procedures and practices in the region
- To improve (ap) capability of educational staff in Region

5) to provide appraisal back-up for referred children

- To establish linkage capability with existing ed. services (ap)
- Do appraisal for referred children
  - (ap) at Center
  - (ap) go to child

6) to improve appraisal resources through improving the resource base and related information

- To disseminate (ap) resource information in region
- To provide resources and people to supplement (ap) in the region

A general model of the service process is depicted in Figure 10.4, based on a model described in references 24 and 25.

The service model represents the movement of the child from the general population, to the Center, and back to his normal setting. At various stages of this movement services are provided to the child. Alternative flows of services, information, and people relative to the flow of the child are indicated. The schematic is a general representation of the service sequences and of the relationships that establish and maintain that sequence. The information established from the diagram indicated the major service components that must exist, their relationships to each other, the order services are provided, a general indication of a management structure, and information that must be generated and utilized.

The general service model outlined presents general classes of activity relating to the service directed activities of: Intake and diagnostic screeming and evaluation, prescriptive services, and outflow-referral. The model is a simplification and each component is representative of a broader process. For example, a management information system (MIS) is included in Figure 10.4, but its structure and the composition of the information flow is not indicated. The development of another model would help to describe the information system,

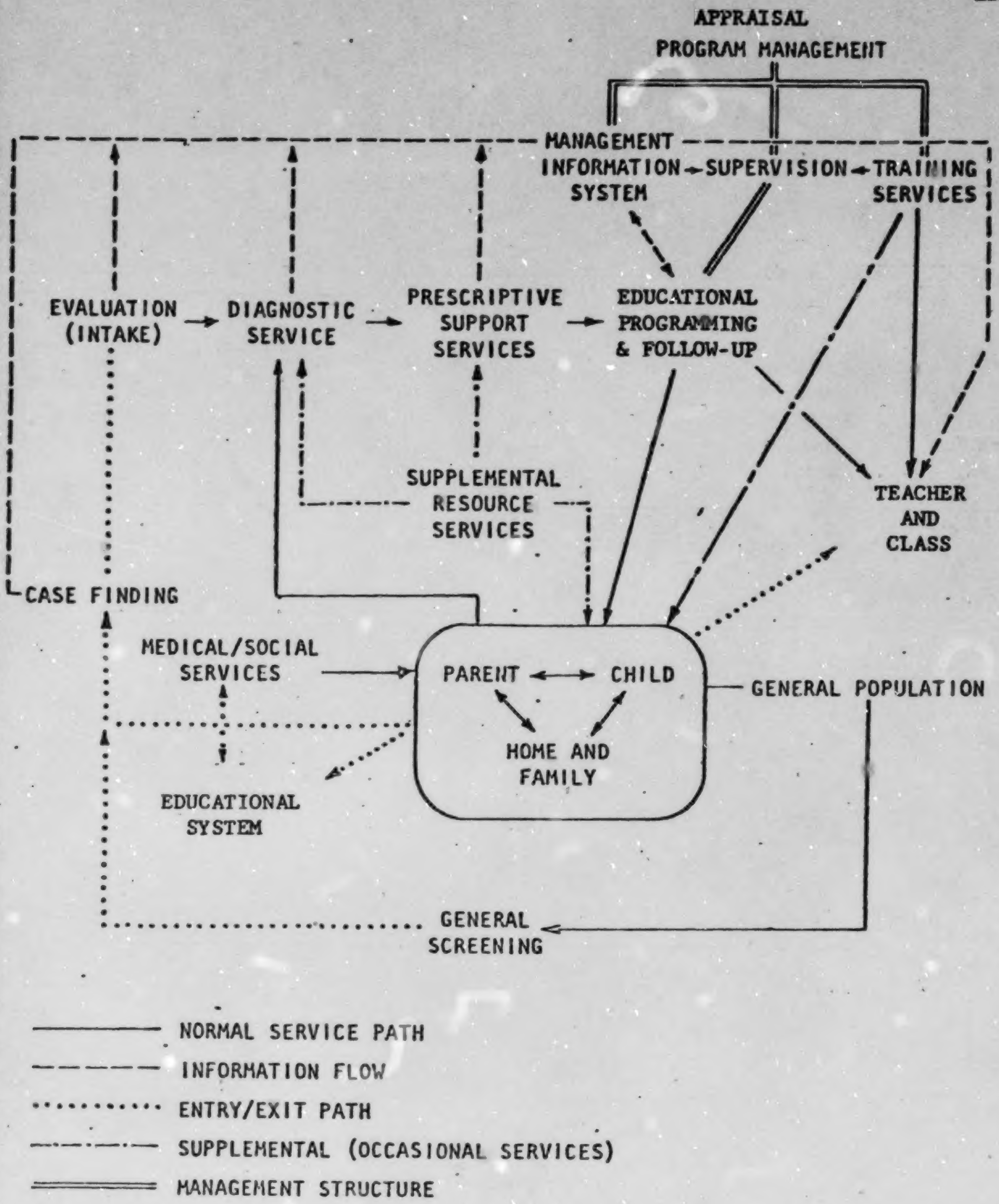

APPRAISAL
PROGRAM MANAGEMENT
MANAGEMENT INFORMATION SYSTEM
SUPERVISION
TRAINING SERVICES
EVALUATION (INTAKE)
DIAGNOSTIC SERVICE
PRESCRIPTIVE SUPPORT SERVICES
EDUCATIONAL PROGRAMMING & FOLLOW-UP
SUPPLEMENTAL RESOURCE SERVICES
TEACHER AND CLASS
CASE FINDING
MEDICAL/SOCIAL SERVICES
PARENT
CHILD
HOME AND FAMILY
GENERAL POPULATION
EDUCATIONAL SYSTEM
GENERAL SCREENING
NORMAL SERVICE PATH
INFORMATION FLOW
ENTRY/EXIT PATH
SUPPLEMENTAL (OCCASIONAL SERVICES)
MANAGEMENT STRUCTURE

FIGURE 10.4 (MC 7)
Service/User Path

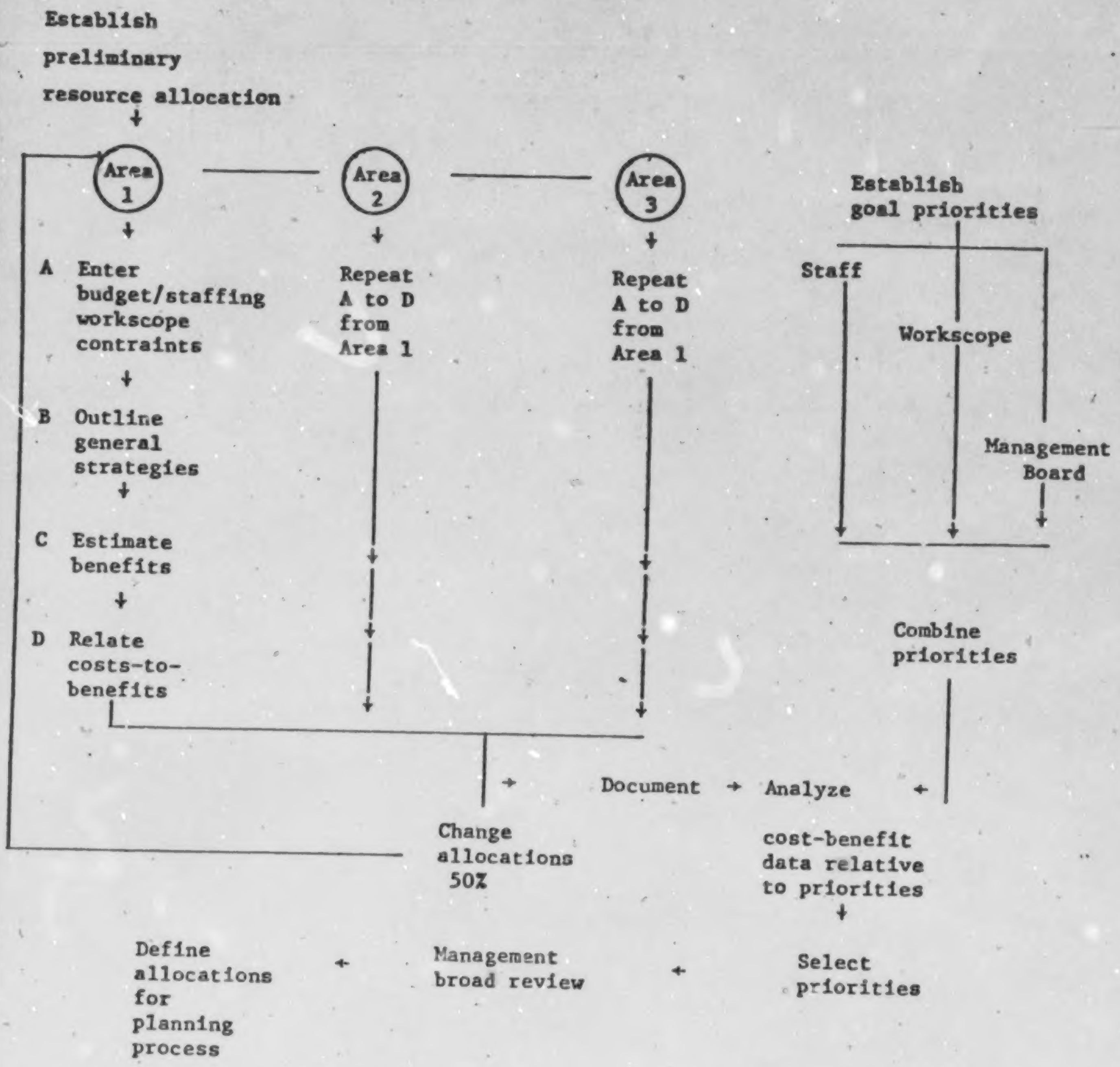

Establish preliminary resource allocation
Area 1
Area 2
Area 3
A Enter budget/staffing workscope contraints
B Outline general strategies
C Estimate benefits
D Relate costs-to-benefits
Repeat A to D from Area 1
Repeat A to D from Area 1
Establish goal priorities
Staff
Workscope
Management Board
Combine priorities
Document
Analyze
Change allocations 50%
cost-benefit data relative to priorities
Select priorities
Management broad review
Define allocations for planning process

Figure 10.2 (MC 8)

A Potential Resource Allocation Process

Value of Process Models

The preceding discussion was designed to illustrate how resources might be allocated within the demonstration activity, and how that activity might be designed. The definition of extensive process models and the accompanying documentation can require extended effort, the question of the value received for the effort expended will become an issue in planning. The value received probably will be dependent on the type of activity desired.

If the perspective of "doing" or "satisficing" requirements is the perspective then the utility will be low. The value of the effort exists only in a directed system, one which seeks to build improved services based on evaluation and improved information. The establishment of a model of the system is the base for a formative evaluation, program analysis, documentation, planning, and implementation of services. The initial documentation forms a baseline of interactions which is a key ingredient of the preceding core processes of Center operations.

Evaluatively the definition of process is critical because it produces a measurement baseline, a statement of intentions, criteria, rationale, and the relationships upon which the evaluative process is dependent. Evaluation in this context is program centered, i.e., What benefits have the monies expended produced?, and How effective were the procedures used? The introduction of benefit or effectiveness parameters introduces the service and its purpose, the improvement of the handicapped child's education. Evaluatively the program rests on the same base as the evaluative elements of direct services.

Another factor which favors the more disciplined approach is if it were desired to work towards optimizing the services providing. Optimization is dependent on describing what improvement is desired, i.e., optimization is done relative to some defined state. The process model provides that definition of state from which improvements can be postulated based on evaluative data.

Management Information

Management is the process of direction and control of resource expenditures to attain specified objectives. The two control parameters most often considered are cost and time because of their ability to act as common denominators. Hypothetically an activity could be defined as a dependent variable that was formed by the transformation of two independent variables (cost and time). The description of the activity would be established by the transformation.

The term "control" implies the expenditure-time pattern has a desired outcome or goal relative to some priorities and planned actions. Information for management therefore must provide some measure of "how things are going", i.e., Are the planned transformations of resources producing the desired outcomes on the defined schedule? Effectively, the process is a combination of projection, measurement, comparison, and adjustment and the management information system should provide the data base for measurement and comparison. An integrated system will collect, contain, and recall the information selected.

In the system design process the objective should be to match the system to the operational needs of the Center. To aid in considering what type of information should be included in the design the needs will be considered in terms of control system factors and related variables. The control system factors that will be considered are: projected or planned activities, actual occurance, and a discrepency measure. The variables to be considered in the limited analysis of this example are: monies, staff, activities, objectives, and time. The factor-variable-response matrix is depicted graphically in Figure 12.1. The following discussion will consider the potential responses.

The first step in establishing an MIS would be to establish the projection or expectancy. This report is an effort at initiating one set of expectations relative to a revised organizational structure. Given this structure, the MIS would be designed in response to the system variables. For the purposes of this presentation, time would be used as a common denominator between variables, and

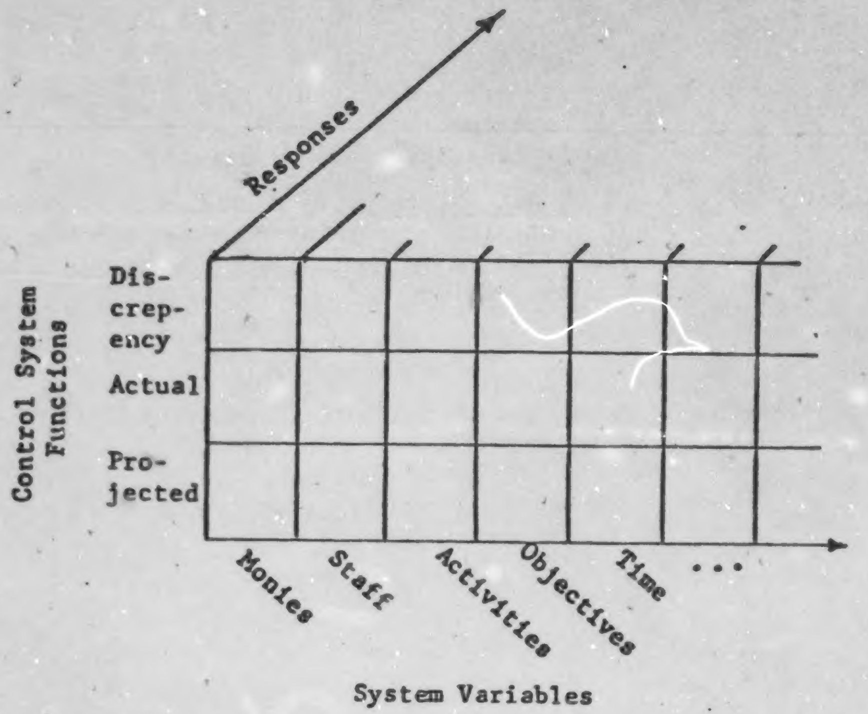

Responses
Dis-crepency
Actual
Pro-jected
Control System Functions
Monies
Staff
Activities
Objectives
Time
. . .
System Variables

Figure 12.1 (MC 9)
Figure-Variable-Response Matrix

cost as an independent variable (analyzed both independently and as a component of the other variables). This procedure provides for overlaps and would provide the possibility of the following two dimensional combinations of variables.

money-staff
money-activity
money-objectives
money-time
staff-activity
staff-objective
staff-time
activity-objective
activity-time
objective-time

The purpose of these combinations is to produce a perspective on system control variables. The interaction of variables suggests that not all pairs have to be monitored, and that it may be possible to consider three-variable sets as a better monitoring base. Given this information one procedure to gain a closure in the selection is to review alternative methods for developing and analyzing this information. The following listing includes some of the most common management information techniques.

Budget-time (activity)	A plot of rate of expenditure per given time period.
Activity-time	Flow charts provide the flow of actions in temporal sequence and include the definition of relationships between activities.
Activity-time	Gantt Charts provide a picture of the timing of activities in relation to each other, but do not indicate the actual relationships between the activities.
Objective-time	Milestone Charts provide a graphic presentation of milestones as a function of time.
Activity-monies	Job-Cost Accounting (pre or post) provides a budget framework for each activity including staff costs (in turn this information then partially includes a time factor because staff time is a constrained variable).
Objective-time	Line of Balance Charts plot the projected objectives versus time and are designed to measure discrepencies of occurance from planned activity.
Activity-time-objective-cost	PERT(Planning, Evaluation and Review Technique) Charts are a combination of flow and Gantt charts to which a capability of analyzing the likelihood of attaining the activity-time sequence as planned is added.
Activity-time-objective-cost	CPM (Critical Path Method) is a method of analyzing the PERT type network to establish the critical paths (maximum time or cost) in the networks.

Each of these techniques has strengths and weaknesses: for example; PERT and CPM are relatively tedious to establish and use; Flow, Gantt, and Milestone Charts include only partial information; and Job-Cost Accounting does not necessarily provide a strong relationship to objectives and component activities. The issue is how to select techniques which will provide the needed management effort with the least expenditure of effort. The approach to be suggested will be based on a minimum effort level needed to establish control and an evaluative base, and that would help to establish whether more sophisticated methods were needed.

The projected or planned MIS devices to be presented assume the existence of an adequate planning base using any one of a number of recognized techniques. Given this base, information control and display techniques are the focus of the design process, and would be expected to be integrated and interfaced with the actual planning process. The suggested methods (depicted graphically in Figure 12.2) and their sequence of development include:

- Flow Charts of activities (indicate activities and temporal sequence)
- Gantt Charts with staffing (indicates time space per activity)
- Cost-time Plot (provides expenditure rate)
- Budget (indicates cost per activity and staffing, i.e., resource allocation).

The suggested techniques provide a basic control on the flow of activities, monies, and staff as a function of time. The same information is presented several times, but in each case the focus is different (see notes in above list). The differing focuses provide a rapid method of chronicling the information and then recalling it. The processes described define a flow of activities, an assignment of time-frame and staff to activities, an expenditure rate, and the composition of the expenditures.

The same forms and techniques suggested an be used for both projections and for documenting occurance. The periodic documentation of occurance in this format is a basis for the development of discrepency measures by which management actions (responses) can be initiated. The combination of procedures is the basis for establishing a management information system, the remaining steps are simply the establishment of a formal system with defined guidelines and operations.

The framework outlined is rudimentary and primative, but does provide the basic information needed to manage and evaluate actions. The framework outlined also provides the basis for a transition to second generation techniques (and eventually to third and fourth generations which were not discussed). The suggested approach is to develop the simple system, to evaluate its effectiveness, and then to decide if more comprehensive information is needed and how best to generate it. From a third part vantage point it does appear that the simple system will meet most Center needs for the immediate future, thus avoiding complex procedures and their associated costs.*

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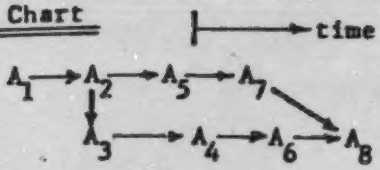
* One evaluative mechanism might be to request technical assistance from CORRC based on some preset Center objectives and then to document the outcomes for further planning.

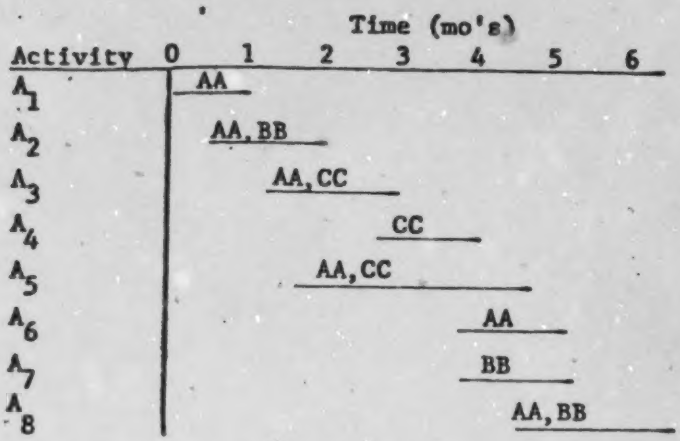
Flow Chart



NOTES

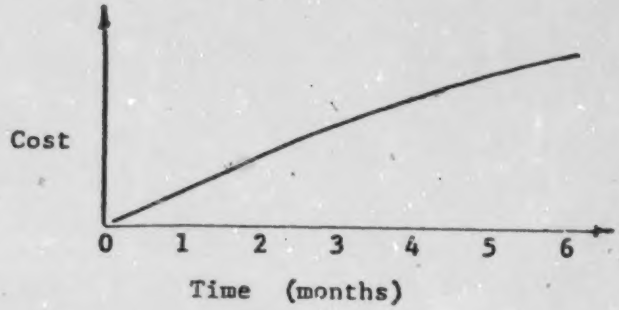
- o A_1 = Activities

Gantt and Staffing Chart



- o AA, BB, CC are staff
- o time assignments for each person also can be indicated

Cost-Time



Budget

Staff (time x rate) ...
Employee benefits .....
Other Direct Costs ....
Indirect Costs ....
Total ....

- o CORRC format could be used
- o each item of budget would be expanded to show actual breakdowns

Figure 12.2 (MC 10)
Examples of Control Charts

COMMENT

This study exemplifies the systems approach in its scope, methodology and detailed elaboration. Particularly noteworthy are the numerous models presented, the complete elaboration of a management by objectives approach, the rigorous search for appropriate measures of performance and the concern with an information collection and retrieval system.

The important distinction between planning and implementation was made. The author wisely suggested an incremental implementation of evaluation procedures starting with simple methods, to minimize staff resistance.

Due to its role in staff training, the study often presented alternatives without pursuing a choice among them through evaluation. Consequently it may best be employed as a rich source of systems applications rather than as a thorough systems study.

APPENDIX MD

Miles, D. C. Cost projections of special education programs: A Colorado study of special education cost projections based upon an expanded year analysis of fixed year data. Unpublished manuscript, Colorado Department of Special Education, undated.

Miles examines the assumptions underlying straight-line projections of fixed incidence rates and historical costs. He hypothesizes that incidence rates are unstable as a result of (a) the criteria upon which incidence rates are established, (b) the rate of remediation, (c) the rate of new entries into the education system, and (d) the rate of reentries of previously remediated students.

Miles also discusses the attainment of a steady state level of services over a 12 year period. Measures of cost-effectiveness are considered for several different educational objectives and strategies, although the computations are not developed fully.

Comment

Miles' projections, although unofficial, nevertheless represent a sophisticated exercise in financial planning. While his discussion is brief, it is one of few that examines the alternative assumptions underlying cost projections.

(Above taken from Bernstein et.al. (1976))

APPENDIX NA

Nash, J. C. The relationship of input factors and rated quality in special education programs. Doctoral dissertation, University of Wisconsin, 1971. (Ann Arbor MI: University Microfilms, No. 71-23, 319)

Nash has constructed an input-output model to determine whether there is a statistical relationship between input factors and the rated quality of special education programs. Nine high quality districts were compared with nine average quality districts in Wisconsin. (The nine high quality districts were the same ones used in Rossmiller's NEFP study of 1970.) Decision variables were related to administrative rather than pedagogical criteria, and no attempt was made to evaluate the attainment of program objectives.

The conclusions for each variable were:

1. *Expenditure inputs*
   a. Personnel—No relation to quality
   b. Supplies and equipment—No relation to quality
   c. Physical facilities—Inadequate data
2. *Educational opportunity inputs*
   a. Number of programs—Positively related to quality
   b. Characteristics of curriculum—Limited data; some relation to quality
3. *Instructional staff inputs*
   a. Pupil-teacher ratios—No relation to quality
   b. Training of teachers—Positive relation to quality
   c. Experience of teachers—Negative relation to quality
   d. Teacher satisfaction—Limited data; no ostensible relation to quality
4. *Administrative inputs* (size of administrative unit)—Average daily membership, equalized total and per pupil valuation, and numbers of teachers and administrators are all positively related to quality.
5. *Nonquantifiable inputs*—Individual leadership, parental participation, administrative philosophy, early identification, and a separate administrative structure appear to be associated with quality.

Comment

The author's interpretations are subject to question in view of the research design employed. In essence, the design is tautological: the two samples were differentiated judgmentally by experts (as in all NEFP studies) according to some implicit quality factors. To the extent these factors were identical to the input factors identified by Nash, a correlational examination of the inputs would tend to reveal the quality factors used by the experts (e.g., program variety, curriculum characteristics, teacher training, district size, and the presence of a full time director). Insofar as the experts used input factors in their judgment of quality, the same results could have been obtained by asking the experts directly what factors influenced their perception of quality. The problem inherent in Nash's research underlines the need for a means of determining quality independent of its components.

(Above taken from Bernstein et. al. (1976))

APPENDIX NB

AUTHOR:	New York City Board of Education, Brooklyn, N.Y.; Office of the Deputy Chancellor.
TITLE:	Cost of educating handicapped pupils in New York City. Special Report No. 2 in a series: Assuring equal educational opportunity for handicapped children in New York City.
PUBLISHER/JOURNAL:	Same as Author.
YEAR:	1977
NO. OF PAGES:	116
ERIC NO.:	ED 137 994

SUMMARY

Reported are the results of a study conducted to determine the cost of educating handicapped pupils in New York City's public schools. Methodology followed in compiling and reporting cost data is outlined, and the data are presented and discussed. Student enrollment is described in terms of the programs and bureaus operated by the Division of Special Education and Pupil Personnel Services (DSEPPS); and such aspects of enrollment as whether pupils receive full-time or part-time services and severity of handicapped type are explained. Delineated are components of special education program costs, and explained are methods of calculating actual costs. Cost per pupil and total dollar cost of each DSEPPS program are given. Preliminary analyses are presented including interprogram comparisons, comparisons of actual costs with estimated costs (based on indices developed for the National Education Research Project), discussion of relative costs of New York City special education programs, and comparison of private versus public school special education costs.

The following were extracted for the purpose at hand.

Due to the difficulties inherent in keeping track of expenditures without having a good cost accounting system, little information exists on what it actually costs to operate special education programs. In order to develop a comprehensive cost profile, it was necessary to draw from various sources — the budget, the payroll, and in some instances "best estimates" based on internal financial records. The end result has been generally reliable program costs which are slightly inflated.

DSEPPS ENROLLMENT

DSEPPS programs have a total enrollment of 78,786.* However, 40,584 of the students included in this figure actually participate in the school system's regular instructional program and only receive special education services on a part-time basis, either in "resource rooms" or from "itinerant teachers."

DSEPPS ENROLLMENT 1975

38,202	+	40,584	=	78,786
FULL-TIME		PART-TIME		TOTAL

Regulations governing the allocation of state education aid to local school districts classify children according to the severity of their handicapping conditions. Certain types of handicaps are severe (e. g., trainable mentally retarded), while other types (e.g., educable mentally retarded) are non-severe. In addition, some students have disabilities or conditions requiring special education services but are not considered handicapped according to the state's narrow definition of the term. Therefore, for the purposes of this study, such students are classified as "regular." Most of these students receive special education services on a part-time basis.

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*Enrollment data here, and throughout the study, are based on November 1975 registers.

Although the classifications "severe," "non-severe," and "regular" are generally accurate ways of describing the seriousness of one handicap type compared with another, there are some surprising anomolies.* Regardless of their imprecision, these terms suggest a potentially useful way of summarizing and analyzing special education enrollment:

DSEPPS ENROLLMENT 1975

15,711	+	23,246	+	39,829	=	78,786
SEVERE		NON-SEVERE		REGULAR		TOTAL

One important example can be used to illustrate both aspects of enrollment mentioned above. The Bureau of Speech Improvement has a program which serves 38,481 students, almost 49% of DSEPPS total enrollment. Though not officially handicapped, these students have disabilities serious enough to warrant part-time speech therapy services.

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*According to state regulations, blindness and brain injury are "non-severe" handicapping conditions. Nevertheless, these are generally considered "severe" conditions by professionals in the field of special education.

Since the state provides aid only after children have been classified according to the specific nature of their handicapping conditions, school systems are encouraged to provide services by type of handicap rather than other pertinent criteria such as age and educational need. Also, for most types of handicapping conditions, the New Yrok State Commissioner of Education has set limits on maximum class size. Thus, the Board of Education has only limited discretion over the scope of its programs for the handicapped.

SEC. VII. SOME INTERPROGRAM COST COMPARISONS

Cost differentials among programs are primarily a function of variations in expenditures for instructional services, supportive clinical services, and transportation. Children with handicaps that require small class sizes for effective education are much more expensive to educate. In his series of studies on special education, William P. McLure has found that the pupil-teacher ratio, or average number of pupils per certified teacher, is the most important factor influencing cost differentials among programs.* This is because the cost of instruction is usually the single largest expenditure in a program.

- Instructional services and support constitute 49% of the total cost of the program for educable mentally retarded children.
- 55% of the Neurologically Impaired-Emotionally Handicapped program costs are in instructional services and support.

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*William P. McLure, Robert A. Burnham, and Robert A. Henderson, Special Education: Needs, Costs, Methods of Financing, University of Illinois at Urbana-Champaign, May 1975.

Transportation costs are also an important factor in explaining the variation in cost among programs. Because special education programs are often located at some distance from a pupil's home, all elementary level pupils are entitled to bus transportation, although some do walk to school. Junior and senior high pupils use public transportation if their handicapping conditions do not prohibit it.

Specially constructed vehicles make the cost of transporting some physically handicapped pupils very high. Transportation costs vary widely among programs depending on the type of vehicle, the passenger capacity of the vehicle, and whether "matron" attendants are used:*

- The average cost of transportation for a child in a class for the severely visually impaired is estimated to be $661 per pupil.
- The estimated cost of transporting a severely orthopedically handicapped child in a lift-bus or ramp-wagon is $3,413 per pupil, almost half of the entire program cost.

---

*It must be emphasized that these transportation costs were calculated from incomplete data. They give a rough idea of the magnitude of the cost differential between types of handicaps, but differences on the order of 10% between programs should not be construed as meaningful.

THREE METHODS OF CALCULATING PROGRAM COSTS

Three separate methods of calculating program costs were used in this study so that data would be useful for various types of analysis. These methods represent different ways of determining which items of expenditure should or should not be included in the total cost of a program. Since one purpose of this study is to compare the cost of special education programs with the cost of the school system's regular educational program, both were calculated by each of the three methods.

The first way of calculating program costs---something we call the "all-inclusive method"---takes into account all funds received and spent by the Board of Education for public school-age children during the nine month school year.* For special education programs, this method sums all the DSEPPS cost components plus all the system-wide administration and support service expenditures attributable to handicapped students. With regard to the school system's regular educational program, the all-inclusive method takes into account the entire budget** for the Board of Education, minus special education program costs. This regular educational program cost was then allocated on an average per pupil basis to all non-handicapped students enrolled in the school system.

The all-inclusive method is based on the assumption that the cost of an educational program is the total of all expenditures related directly or indirectly to its operation---regardless of whether such expenditures are aimed primarily at serving the "educational" purpose of the program. Although this method effectively accounts for all funds received and spent by the school system, it probably results in an inflated estimate of what educational programs actually cost. From our point of view, a more realistic estimate would depend on excluding certain indirect items of expenditure.

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*The Board of Education's budget reflects expenditures for services to non-public schools, summer programs, continuing education and after-school activities. Consequently, these expenditures were excluded from all three methods of calculating program costs.

**1975-1976 Budget FM-136.

The second way of calculating program costs---the "basic education program method"---yields the closest estimate of what we consider the actual cost of operating educational programs in New York City's public schools. This method excludes various forms of reimbursable aid, funds aimed at supporting activities and services which are either experimental or primarily non-educational in nature.* For example, funds provided under the Comprehensive Employment Training Act (CETA) serve the national policy objective of bringing unemployed people into the work force. Although pupils do benefit from CETA, such aid is only tangentially related to the on-going operation of the school system's programs. The services associated with CETA (and many other forms of reimbursable aid) would probably not be continued without federal funding.

The third way of calculating program costs---the "Rossmiller method"---serves a specialized purpose, one which allows us to compare the results of the present study with indices of cost based on data from twenty-four other school districts. This method, with a few exceptions, uses the same narrow definition of program costs developed by Richard A. Rossmiller, et. al. in a major study conducted for the National Education Finance Project.* According to this method, only those cost components related to the "core educational program" (both regular and special) are included in the calculation. Many items of expenditure are excluded---for example, those related to capital outlay, debt service, vocational-technical education, and a variety of services supported by reimbursable funds. These items are excluded because they represent costs which vary significantly from school district to school district. Although the Rossmiller method, with all its exclusions, probably underestimates what educational programs actually cost, it does permit inter-district comparisons which otherwise would not be possible.

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*Certain types of reimbursable aid---Titles I and VI of ESEA and aid for pupil health services---are not excluded from this method because they fund the day-to-day operating costs of essential education and support services.

To recapitulate, three methods of calculating special (and regular) education program costs were used in this study so that data would be available for various types of analysis:

- The All-inclusive Method
- The Basic Education Program Method
- The Rossmiller Method

Each of these methods represents a different way of defining what constitutes the total cost of a program. See Table 5 for a summary of expenditure items excluded from each method.

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*Richard A. Rossmiller, James A. Hale, and Lloyd E. Frohreich, Educational Programs for Exceptional Children: Resource Configurations and Costs, University of Wisconsin, 1970. Although the Rossmiller study excludes kindergarten from its definition of program costs, the present study does not. Methodologically, it would have been too difficult (if not impossible) to separate expenditures for kindergarten from New York City's total public school program.

Table 2 (NB 1)

FUNCTIONAL COST COMPONENTS
DIVISION OF SPECIAL EDUCATION AND PUPIL PERSONNEL SERVICES

- Central DSEPPS Management
- Handicap Bureau Management
    - Administration
    - Clerical and Secretarial
- Instructional Services
    - Supervisors
    - Teachers
    - Teacher Aides
- Instructional Support
    - Supplies and Equipment
    - Guidance Counselors
    - Other Professionals
    - Diagnostic/Clinical Service
    - Speech Services
- Institutional Operations
    - Leasing
    - Fringe Benefits
    - Pensions
- ESEA Title VI-B Funds
- ESEA Title 1 FUNDS
- Other Reimbursable Funds
- Transportation

[a] Funds used to continue support for basic educational programs which commenced last year to serve previously unserved children. Title VI speech funds are included.

Table 4 (NB 2)
SHARED ADMINISTRATIVE AND SUPPORT SERVICE COST COMPONENTS

CATEGORY	FUNCTIONS INCLUDED
I. Instructional Programs	
A. Direct Instructional Programs	District School Boards and Administration School Principals High School Administration Computer Scheduling
B. Indirect Instructional Programs	Attendance and Guidance Services Planning, Research and Development Services
C. Ancillary Pupil Support Programs	School Security School Lunch
II. City-wide Administration and Support	
A. Board of Education/Policy Development	Board of Education Offices of Secretary and Legislative Representative
B. General City Administration	Executive Offices Audit, Management, and Legal Services Labor Relations Public Affairs
C. Personnel	Personnel Offices Board of Examiners Staff Development
D. Business and Administration	Payroll Information Systems Educational Statistics Bureau of Supplies Budget and Accounting Control
III. Facilities Planning, Construction, Operation and Maintenance	Custodial Service Leasing Heat, Light, and Power Planning Educational Construction Fund
IV. Pensions and Fringe Benefits	For Non-Teaching Personnel
V. Reimbursable and Funded Programs	Medical, Dental, and Health Comprehensive Employment Training Act (CETA) Youthful Drug Abuser Work Relief Employment Program (WREP) Emergency Employment Act (EEA)
VI. Collective Barghining Reserve	Unallocated Appropriation
VII. Debt Service	Interest and Redemption of Principal

N.B. Total cost divided by total public school enrollment equals per pupil administration and support cost.

TABLE 5 (NB 3)
THREE METHODS OF CALCULATING SPECIAL EDUCATION PROGRAM COSTS: ITEMS OF EXPENDITURE EXCLUDED

	ALL-INCLUSIVE METHOD	BASIC EDUCATION PROGRAM METHOD	ROSSMILLER METHOD
DSEPPS COSTS	– No Exclusions	– "Other Reimbursable Funds"	– Title 1 – "Other Reimbursable Funds"
ADMINISTRATION AND SUPPORT SERVICE COSTS	– No Exclusions	– CETA, Youthful Drug Abuser, WREP and EEA Funds	– Administrative Costs of Bilingual and Special Educational Need Programs – Educational Construction Fund – Debt Service – CETA, Youthful Drug Abuser, WREP, and EEA Funds

Table 6 (NB 4)
COST OF EDUCATING HANDICAPPED PUPILS IN NEW YORK CITY
ROSSMILLER METHOD
NOVEMBER 1975

	NUMBER OF PUPILS	DIRECT COST	TRANSPORTATION	ADMINISTRATIVE AND SUPPORT SERVICE COST	ROSSMILLER METHOD TOTAL COST
	COST PER PUPIL				
BUREAU FOR CHILDREN WITH RETARDED MENTAL DEVELOPMENT					
Educable Mentally Retarded - NS	6,644	$ 2,764	$ 612	$ 540	$ 3,916
Trainable Mentally Retarded - S	1,957	3,444	1,145	540	5,129
Track IV - S	264	5,749	1,207	540	7,496
Doubly Handicapped/Mentally Retarded - S	513	4,278	2,372	540	7,190
Occupational Training Center - EMR - NS	766	3,052	186	540	3,778
Occupational Training Center - TMR - S	409	3,272	186	540	3,998
Occupational Training Center - EMR/TMR - S	126	[illegible]	693	540	5,334
Mean/Total Cost Severe	3,215	3,750	1,179	540	5,469
Mean/Total Cost Non-Severe	9,403	2,787	579	540	3,906
Mean/Total Bureau Cost	12,618	3,221	724	540	4,485
BUREAU FOR SOCIALLY MALADJUSTED AND EMOTIONALLY DISTURBED CHILDREN					
600 Center Classes - S	1,079	$ 6,914	$ 1,573	$ 540	$ 9,027
600 Center Classes - NS	2,919	[illegible]	914	540	[illegible]
Special Day School - S	2,271	4,214	425	540	5,179
SMED Cluster School - S	1,284	5,459	-	239	[illegible]
SMED Cluster School - NS	5,271	3,974	-	239	4,213
Mean/Total Cost Severe	[illegible]	5,219	668	447	6,334
Mean/Total Cost Non-Severe	8,795	4,444	357	370	5,171
Mean/Total Bureau Cost	11,916	4,842	515	410	5,767
BUREAU FOR THE EDUCATION OF THE PHYSICALLY HANDICAPPED					
HC Bus - NS	476	$ 4,271	$ 1,127	$ 540	$ [illegible]
HC-20 - S	425	3,718	3,419	540	7,677
Brain Injured Health - NS	[illegible]	[illegible]	[illegible]	540	5,076
Hospital School - S	496	[illegible]	-	239	[illegible]
School for Career Development - S	[illegible]	[illegible]	[illegible]	540	6,119
School for Pregnant Girls - S	[illegible]	[illegible]	194	540	[illegible]
Home Instruction - S	741	[illegible]	-	239	[illegible]
Home Instruction Physical - S	1,112	[illegible]	-	239	5,145
Home Instruction Emotional - S	638	4,915	-	239	5,154
Mean/Total Cost Severe	5,626	[illegible]	735	370	[illegible]
Mean/Total Cost Non-Severe	5,949	[illegible]	919	540	[illegible]
Mean/Total Cost Regular	1,928	[illegible]	128	455	[illegible]
Mean/Total Bureau Cost	15,967	4,155	776	436	5,367
Mean/Total Bureau Cost without Regular	3,913	4,357	863	436	5,656

N.B. Remainder of table was illegible in copy reviewed.

Table 7 (NB 5)

COST OF EDUCATING HANDICAPPED PUPILS IN NEW YORK CI
BASIC EDUCATIONAL PROGRAM METHOD
NOVEMBER 1975

	NUMBER OF PUPILS	COST PER PUPIL			
		DISEPPS* COST	TRANSPORTATION**	ADMINISTRATIVE AND SUPPORT SERVICE COST	TOTAL COST
BUREAU FOR CHILDREN WITH RETARDED MENTAL DEVELOPMENT					
Educable Mentally Retarded - NS	8,644	$ 2,845	$ 612	$ 786	$ 4,243
Trainable Mentally Retarded - S	1,057	3,444	1,165	786	5,395
Track IV - S	264	5,749	1,207	786	7,742
Doubly Handicapped/Mentally Retarded - S	363	5,950	2,292	786	9,028
Occupational Training Center - EMR - NS	756	3,220	186	786	4,192
Occupational Training Center - TMR - S	474	3,440	186	786	4,412
Occupational Training Center - DV/MH - S	[illegible]	3,960	693	786	5,449
Mean/Total Cost Severe	3,018	3,899	1,178	786	5,863
Mean/Total Cost Non-Severe	9,400	2,875	579	786	4,240
Mean/Total Bureau Cost	12,418	3,124	720	786	4,630
BUREAU FOR SOCIALLY MALADJUSTED AND EMOTIONALLY DISTURBED CHILDREN					
"A" Center Classes - S	1,575	$ 6,819	$ 1,073	$ 786	$ 8,678
"B" Center Classes - NS	2,515	5,145	829	786	6,760
Special Day School - S	2,671	5,071	420	786	6,277
SMED Cluster School - S	1,845	5,675	–	482	6,157
SMED Cluster School - NS	3,271	4,250	–	482	4,732
Mean/Total Cost Severe	6,132	5,726	668	692	7,086
Mean/Total Cost Non-Severe	5,785	4,639	357	614	5,609
Mean/Total Bureau Cost	11,919	5,187	515	654	6,356
BUREAU FOR THE EDUCATION OF THE PHYSICALLY HANDICAPPED					
MC Bus - NS	929	$ 3,371	$ 1,147	$ – a	$ 5,504
MC-20 - S	345	3,514	3,415	786	7,715
Brain Injured (MC-30) - NS	5,025	4,760	864	786	6,410
Hospital School - S	277	3,488	–	482	3,970
School for Career Development - S	136	5,187	392	786	6,365
School for Pregnant Girls - R	957	3,957	186	786	4,930
Home Instruction - R	381	4,970	–	482	5,452
Home Instruction Physical - S	1,112	4,906	–	482	5,388
Home Instruction Emotional - S	634	4,925	–	482	5,407
Mean/Total Cost Severe	3,626	4,267	703	664	5,634
Mean/Total Cost Non-Severe	5,893	4,564	903	786	6,253
Mean/Total Cost Regular	1,348	4,249	128	700	5,077
Mean/Total Bureau Cost	10,867	4,427	776	701	5,904
Mean/Total Bureau Cost Less Regular	9,519	4,451	863	702	6,016

N.B. Remainder of table was illegible in copy reviewed.

Table 8 (NB 6)

COST OF EDUCATING HANDICAPPED PUPILS IN NEW YORK CITY
ALL INCLUSIVE METHOD

NOVEMBER 1975

	NUMBER OF PUPILS	COST PER PUPIL DIRECT COST	TRANSPORTATION COST	ADMINISTRATIVE AND SUPPORT SERVICE COST	TOTAL COST
BUREAU FOR CHILDREN WITH RETARDED MENTAL DEVELOPMENT					
Educable Mentally Retarded - HS	8,644	$ 2,914	$ 612	$ 816	$ 4,342
Trainable Mentally Retarded - S	1,457	3,673	1,165	816	5,654
Trace [illegible] - S	254	5,744	1,257	816	7,772
Doubly Handicapped Mentally Retarded - S	363	5,868	2,372	816	9,056
Occupational Training Center - EMR - HS	750	3,242	186	816	4,244
Occupational Training Center - TMR - S	436	3,463	186	816	4,465
Occupational Training Center - [illegible] - S	126	3,975	643	816	5,434
Mean Total Cost Severe	3,014	4,047	1,174	816	6,037
Mean Total Cost Non-Severe	9,420	2,943	576	816	4,335
Mean Total Bureau Cost	12,434	3,216	720	816	4,752
BUREAU FOR SOCIALLY MALADJUSTED AND EMOTIONALLY DISTURBED CHILDREN					
"A" Center Classes - S	1,575	$ 6,932	$ 1,073	$ 816	$ 8,821
"B" Center Classes - HS	2,515	5,185	878	816	6,879
Special Day School - S	2,971	5,071	420	816	6,307
SMED Cluster School - S	1,995	5,788	-	512	6,300
SMED Cluster School - HS	3,771	4,497	-	512	5,009
Mean Total Cost Severe	6,137	5,760	654	722	7,136
Mean Total Cost Non-Severe	5,780	4,255	157	644	5,056
Mean Total Bureau Cost	11,919	5,221	515	688	6,420
BUREAU FOR THE EDUCATION OF THE PHYSICALLY HANDICAPPED					
HC 30s - HS	920	$ 3,432	$ 1,147	$ 816	$ 5,395
HC 20s - S	985	3,679	2,413	816	7,908
Brain Injured Hospital - HS	5,283	4,822	968	816	6,562
Hospital Schools - S	900	3,567	-	512	4,079
School for Career Development - S	136	5,5[illegible]	247	816	6,[illegible]
School for Pregnant Girls - S	401	3,951	186	816	4,953
Home Instruction - S	391	4,982	-	512	5,494
Home Instruction Physical - S	1,112	4,906	-	512	5,418
Home Instruction Emotional - S	914	4,925	-	512	5,437
Mean Total Cost Severe	3,929	4,320	793	594	5,707
Mean Total Cost Non-Severe	5,433	4,066	463	816	5,345
Mean Total Cost Regular	1,340	4,250	124	733	5,107
Mean Total Bureau Cost	13,967	4,478	776	731	5,985
Mean Total Bureau Cost Less Regular	8,513	4,513	862	732	6,105

N.B. Remainder of table omitted.

Table 12 (NB 7)

ROSSMILLER METHOD EXPECTED COST OF SPECIAL EDUCATION PROGRAMS IN PUBLIC SCHOOLS OF NEW YORK CITY
1975-1976

	AVERAGE COST PER REGULAR PUPIL	ROSSMILLER INDEX	EXPECTED COST
Educable Mentally Retarded	$1,853	1.87	$3,465
Trainable Mentally Retarded	$1,853	2.10	$3,891
Auditorily Handicapped	$1,853	2.99	$5,540
Visually Handicapped	$1,853	2.97	$5,503
Physically Handicapped	$1,853	3.64	$6,745
Speech Handicapped	$1,853	1.18	$2,187
Special Learning Disorders	$1,853	2.16	$4.002
Emotionally Disturbed	$1,853	2.83	$5,244
Multiply Handicapped	$1,853	2.73	$5,059

Table 13 (NB 8)

COMPARISON OF ROSSMILLER METHOD EXPECTED COSTS AND NEW YORK CITY ACTUAL COSTS FOR HANDICAPPED CHILDREN

NOVEMBER 1975

		NYC ACTUAL ROSSMILLER METHOD COST*	ROSSMILLER EXPECTED COST	PERCENT DIFFERENCE
1.	Educable Mentally Retarded	$ 3,909	$ 3,465	+ 13%
2.	Trainable Mentally Retarded	4,947	3,891	+ 27
3.	Auditorily Handicapped	5,593	5,540	+ 1
4.	Visually Handicapped	5,558	5,503	+ 1
5.	Physically Handicapped	6,342	5,745	- 6
6.	Speech Handicapped	2,041	2,187	- 7
7.	Special Learning Disorders	6,241	4,002	+ 56
8.	Emotionally Disturbed	5,767	5,244	+ 10
9.	Multiply Handicapped	9,605	5,059	+ 90

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*Each category includes the following NYC programs, according to the Rossmiller definitions:

1) EMR Class, Occupational, Training Center - EMR; 2) TMR Class, Occupational Training Center - TMR; 3) Whole bureau except School for Language and Hearing Impaired; 4) Whole bureau; 5) HC bus, HC-20; 6) Speech Centers, public school itinerant services to regular pupils; 7) School for Language and Hearing Impaired, HC-30, School for Career Development; 8) Whole bureau; 9) Doubly Handicapped/Mentally Retarded Classes and Occupational Training Center, Center for Multiply Handicapped, Pre-Placement classes, Neurologically Impaired-Emotionally Handicapped.

Special education programs in New York City generally include more severely handicapped children than other districts. New York City's population is so large that there are enough children with any specific handicap to form a "program" in the school system. Therefore, New York City's costs tend to be higher. For instance, the high comparative cost of the program for multiply handicapped children is probably due to the fact that New York City is serving severely handicapped pupils who would be in institutions or private schools if they lived in other school districts. It is only in the last few years that some school systems have begun serving children with such extensive handicaps. Other analysts have also noted Rossmiller's low cost factor for the multiple handicapped group.*

"Special learning disorders" constitute another type of handicap having actual costs higher than projected costs. Once again, this is probably due to the fact that our school system provides special education services only to the most severely handicapped within this category. This happens because special learning disorders are not considered an "aidable" category by New York State. Therefore, the less severely handicapped within this category are not provided with special education services.

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*Federal Register, Vol. 41, No. 96 -- Monday, May 17, 1976, p. 20355.

Another factor which explains some of the difference between projected and actual costs in New York City is related to the methodology used in the Rossmiller study. The Rossmiller indices are actually the ratios calculated from the median, or middle cost district in each handicap category. Half of the districts surveyed had higher ratios. Therefore, it is not surprising that some of New York City's costs are higher than those projected from the median cost district.

In spite of all these qualifications, the projections based on the Rossmiller indices are an indicator, however flawed, of an adequate cost for a special education program. New York City programs having costs which are higher than those projected should be scrutinized closely to determine the cost-efficiency of the services provided.

Table 14 (NB 9)

COST OF SPECIAL EDUCATION PROGRAMS RELATIVE TO THE REGULAR EDUCATION PROGRAM*
NEW YORK CITY PUBLIC SCHOOLS
NOVEMBER 1975

PROGRAMS	INDEX
REGULAR PROGRAM	1.00
BUREAU FOR CHILDREN WITH RETARDED MENTAL DEVELOPMENT	
Educable Mentally Retarded - NS	1.85
Trainable Mentally Retarded - S	2.35
Track 1a - S	3.37
Doubly Handicapped Mentally Retarded - S	3.93
Occupational Training Center [illegible] - NS	1.83
Occupational Training Center TMR - S	1.92
Occupational Training Center Jr. Hi. S	2.37
Mean Cost Severe	2.56
Mean Cost Non-Severe	1.85
Mean Bureau Cost	2.02
BUREAU FOR SOCIALLY MALADJUSTED AND EMOTIONALLY DISTURBED CHILDREN	
"A" Center Classes - S	4.13
"A" Center Classes - NS	2.55
Special Day School - S	2.74
SMED Cluster School - S	2.66
SMED Cluster School - NS	2.06
Mean Cost Severe	3.04
Mean Cost Non-Severe	2.45
Mean Bureau Cost	2.77
BUREAU FOR THE EDUCATION OF THE PHYSICALLY HANDICAPPED	
HC Bus - NS	2.31
[illegible] - S	3.41
Brain Injured [illegible] - NS	2.79
Hospital School - S	1.73
School for Career Development - S	2.77
School for Pregnant Girls - R	2.15
Home Instruction - R	2.30
Home Instruction Physical - S	2.35
Home Instruction Emotional - S	2.36
Mean Cost Severe	2.45
Mean Cost Non-Severe	2.73
Mean Cost Regular	2.21
Mean Bureau Cost	2.57
Mean Bureau Cost Excluding Regular	2.62

PROGRAMS**	INDEX
BUREAU FOR THE VISUALLY HANDICAPPED	
Classes - S	2.91
Classes - NS	2.24
Resource/Itinerant - NS	2.09
Mean Cost Severe	2.91
Mean Cost Non-Severe	2.56
Mean Bureau Cost	2.59
BUREAU FOR THE HEARING HANDICAPPED	
Classes - S	1.75
Work Study - S	1.90
School for the Deaf - S	3.61
School for Language and Hearing Impaired - S	3.58
Resource/Itinerant - NS	1.93
Mean Cost Severe	3.39
Mean Cost Non-Severe	1.93
Mean Bureau Cost	2.90
BUREAU FOR SPEECH IMPROVEMENT	
Speech Centers - NS	2.00
Itinerant Services - R	1.06
NEUROLOGICALLY IMPAIRED - EMOTIONALLY HANDICAPPED - S	5.48
PRE-PLACEMENT CLASSES - S	3.44
READINESS CLASSES - S	3.32
CENTER FOR MULTIPLY HANDICAPPED - S	6.13
ALL HANDICAPPED PUPILS* **	2.57
Mean Cost Severe	3.02
Mean Cost Non-Severe	2.26

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*Basic educational program method of calculating costs. This excludes certain state and federally funded categorical programs which are primarily non-educational in nature.

**S - Severe Handicap
NS - Non-Severe Handicap
R - Regular Pupil

***Excludes pupils who are classified as "regular" for state aid purposes.

TABLE NB 10

BUREAU FOR CHILDREN WITH RETARDED MENTAL DEVELOPMENT
DSEPPS PER PUPIL COST PROFILE
NOVEMBER 1975

	EMR NON-SEVERE	TMR SEVERE	TRACK IV SEVERE	DH/MH SEVERE	OTC-EMR NON-SEVERE	OTC-TMR SEVERE	[illegible]	MEAN COST SEVERE	MEAN COST NON-SEVERE	MEAN COST TOTAL
Register	8,644	[illegible]	[illegible]	363	756	[illegible]	[illegible]	3,018	9,400	12,418
% of Total Register	69.6%	15.0%	2.1%	2.9%	6.1%	3.1%	[illegible]	24.3%	75.7%	100.0%
General Office Management	$ 17	$ 17	$ 15	$ 16	$ 17	$ 17	$ [illegible]	$ 17	$ 17	$ 17
Bureau Management	27	27	27	27	91	91	[illegible]	38	32	34
Administrative	16	16	16	15	16	16	[illegible]	16	16	16
Clerical & Secretarial	11	11	11	11	75	75	[illegible]	22	17	18
Instructional Services	1,775	2,312	2,966	3,259	1,769	1,943	2,14[illegible]	2,427	1,776	1,934
Supervision	43	43	44	48	153	153	[illegible]	68	57	60
Teachers	1,725	2,167	2,328	2,781	1,576	1,733	[illegible]	2,185	1,708	1,824
Teacher Aides	7	95	594	428	63	57	[illegible]	175	12	50
Instructional Support	292	288	284	294	304	305	[illegible]	291	299	297
Supplies & Equipment	23	18	18	26	56	56	[illegible]	26	31	30
Guidance Counselors	21	21	20	21	21	21	[illegible]	21	21	21
Other Professionals	-	-	-	-	-	-	[illegible]	-	-	-
Diagnostic/Clinical	213	214	211	212	192	192	14	209	211	211
[illegible] Services	35	35	35	35	36	36	[illegible]	35	35	35
Institutional Operations	619	768	818	967	914	877	[illegible]	759	635	665
Leasing	-	-	-	-	285	185	[illegible]	33	15	19
Fringe Benefits	163	202	213	251	174	193	[illegible]	207	163	174
Pensions	457	566	605	716	456	503	[illegible]	519	457	472
SUB-TOTAL	$2,736	$3,412	$4,112	$4,563	$3,024	$3,240	$3,4[illegible]	$3,532	$2,759	$2,947
Title VI	24	32	1,637	313	28	32	3	218	28	74
SUB-TOTAL	$2,760	$3,444	$5,749	$4,876	$3,052	$3,272	$3,5[illegible]	$3,750	$2,787	$3,021
Title I	85	-	-	993	168	168	[illegible]	149	88	103
SUB-TOTAL	$2,845	$3,444	$5,749	$5,868	$3,220	$3,440	$3,[illegible]	$3,899	$2,875	$3,124
Other Reimbursable	69	229	0	0	22	23		144	65	84
SUB-TOTAL	$2,914	$3,673	$5,749	$5,868	$3,242	$3,463	$3,9[illegible]	$4,043	$2,940	$3,208
Transportation*	612	1,165	1,207	2,372	186	186	6	1,178	579	728
TOTAL	$3,526	$4,838	$6,956	$8,240	$3,428	$3,649	$4,5[illegible]	$5,221	$3,519	$3,936

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*Transportation costs are based on March 1976 register. Per pupil costs may differ slightly from th se calculated directly from figures for total dollar costs.

N.B. Column "OTC DH/MR, SEVERE" was illegible

COMMENT

This ambitious study attempted to enumerate the costs of a wide variety of programs. Though much data was generated, its applicability remained, for the most part, particularistic. Costs of programs related to degree of severity of handicapping conditions was explored using a somewhat arbitrary administrative measure of degree of handicap. In addition, illegibility of parts of Tables 6 and 7 severely limited the present author's use of that cost data. Costs of different delivery systems was not addressed directly, with the result that only partial data were presented.

On the positive side, utlization of three methods of calculating costs has created the opportunity to explore the effects of costing method on costs and cost indices. In addition, the existence of a wide variety of programs for the mentally retarded has permitted the estimation of costs of relatively rare public school programs. Table presents the efforts of the present author, basing his calculations primarily on the data of Table NB 9 6. The Basic Education and All-inclusive Methods gave fairly similar cost indices , while the Rossmiller Method resulted in consistently higher cost indices. It was argued that the Basic Education Method gave the set of cost data that best reflected the actual costs of programs in New York State by considering more of the actual costs and particular funds. This particularistic approach invalidates comparison with other states. In contrast, the Rossmiller Method generated cost indices that can be used for comparison purposes, but must be supplemented with cost information particular to the state in question (e.g. capital outlay).

Costs calculated according to the Rossmiller method were compared with expected costs based on Rossmiller's cost indices (Table 13). Poor fit was evident for Special Learning Disorders (56% underestimation) which was explained by the high severity of handicapping conditions involved. Poor fit was also found for Multiply Handicapped (90% underestimation). The authors failed to underline that Rossmiller warned against using that particular cost index as it was based on a very small sample. Discounting these two poor fits, and remembering the warning that the New York costs were slightly inflated, the overall fit appears fairly good. However, the fact remains that Rossmiller's sample was composed of states, and school districts within them, noted for their "best practice" while no such discrimination was made in the New York study.

TABLE NB 11: Cost Indices of Programs for the Mentally Retarded Based on Three Methods of Calculating Program Costs.

Program Title	Rossmiller Method		Basic Education Method		All-inclusive Method	
School	COST[b]	C.INDEX[c]	COST[c]	C.INDEX[c]	COST[d]	C.INDEX[e]
EMR	$3916	2.11	$4,243	1.85	$4,342	1.81
TMR	$5149	2.78	$5,395	2.35	$5,654	2.35
Track IV[a]	$7,496	4.05	$7,742	3.37	$7,772	3.23
DH/MR[a]	$7,790	4.20	$9,026	3.93	$9,056	3.77
Occupational						
EMR	$3,778	2.04	$4,192	1.83	$4,244	1.77
TMR	$3,998	2.16	$4,412	1.92	$4,465	1.86
DH/MR	$5,034	2.72	$5,448	2.37	$5,484	2.28

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[a] Tract IV: Classes for profoundly retarded children. Recently a number of children have been accepted who were released under legal mandate, from the state-funded Willowbrook Developmental Center.

DH/MR: Doubly handicapped/Mentally Retarded.

[b] Figures taken from Table NB4.

[c] Figures taken from Table NB5.

[d] Figures taken from Table NB6.

[e] The cost index was calculated by dividing the special program cost by the regular program cost.

Cost of regular (normal) program as reported in the text: Rossmiller Method : $1,853.00 (p. 46)
Basic Education Method: $2,294.00 (p. 52)
All-inclusive Method : $2,404.00 (p. 45, Table 11).

APPENDIX PA

Author: Public Policy Committee, British Columbia Federation of the Council for Exceptional Children.
Title: On behalf of exceptional children.
Publisher/Journal: B.C. Federation of the Council for Exceptional Children.
Date: 1977
No. of pages: 24

SUMMARY

This document outlined the basic needs, and the directions which educational planning should take to benefit exceptional children. Several of the more important premises and conclusions were as follows:

1 All children have the right to an appropriate education which should be provided by a qualified teacher on the basis of their individual needs, interests, and abilities. Appropriate legislation appears to be the best vehicle by which to guarantee this right.

2 Particularly in special education, there exists a need for specially prepared and qualified personnel. Existing programs should be upgraded and new ones established to ensure that there is a sufficient supply of teachers and supportive personnel to meet the needs of exceptional children in British Columbia.

3 An Office of Child Development should be established to coordinate the health, welfare and educational services that all preschool children, including those who are exceptional, require. Such an agency would provide information, keep records, institute long range educational planning, initiate specialized local services and support conduct or initiate research.

4 An Advisory Committee should be established to advise the Minister of Education on matters of special education. A committee of this nature would ensure that the interests and wishes of the public are made available to the Minister on matters concerning special education.

5 Preventive services are far more efficient in the long run than any corrective or ameliorative ones. For example, the Step-Up Program (Vancouver) has demonstrated, in working with juveniles, that intervention can and does reduce the number of delinquencies. It is unfortunate that the individuals must face courts before their problems are recognized. Similarly, many of the adverse effects of handicapping conditions can be reduced with early intervention.

6 A system of flexible funding for exceptional children must be established. This system would allow the schools and other agencies to react fully and competently to the needs of the individual exceptional child.

7 Programs and services for all children, including those who are exceptional in some manner, should be delivered through the "least restrictive and least segregating" environments. The local school is the most logical place where these programs and services should be established. Where the school is not the appropriate agency, community based services rather than institutions or other segregating environments would be the preferred alternatives.

The following details were extracted for the purpose at hand.

Early intervention (see no. 5) was conceptualized as a coordinated system of preschools and kindergartens established, integrated, and articulated in conjunction with elementary schools. These early childhood programs could provide screening services for individual planning purposes.

Educational funding for exceptional children (see no. 6) should be provided on the basis of individual requirements. If a provision or program is required for an individual, the appropriate funds should be provided. The following table outlines the various existing methods of funding local school districts grouped into the three main categories of unit reimbursement, per pupil reimbursement, and special reimbursement.

TABLE PA 1

METHODS OF FINANCING SPECIAL EDUCATION

UNIT REIMBURSEMENT	**IA** Unit per class or special education students. Class size varies according to category.	**IB** Unit percentage reimbursement e.g. 70% of costs of special education.	**IC** Unit straight sum. Reimbursement, e.g. sum per teacher, adminstration, psychologist, special education therapist, etc.
PER PUPIL REIMBURSEMENT	**IIA** P.P. Straight sum reimbursement in excess of the general per pupil reimbursement, e.g. $500.	**IIB** P.P. Excess cost formula. Total cost paid in excess of educating a non-handicapped child.	**IIC** P.P. Weighted formula. A multiplier is used in determining the reimbursement, e.g. 300% x the average daily attendance of handicapped children.
SPECIAL REIMBURSEMENT	**IIIA** • Instructional materials • Media • Transportation • Facilities • Research • Personnel training	**IIIB** • Transportation • Equipment • Residential care	**IIIC** • Research

APPENDIX RA

AUTHOR:	Reynolds, M.C.
TITLE:	A strategy for research.
PUBLISHER/JOURNAL:	Exceptional Children, Vol. 29, 213-219
DATE:	1963
NO. OF PAGES:	7

SUMMARY

The following summary and comment were taken from Bernstein (1976).

Reynolds reviews both the opportunities and the pitfalls presented by special education research. His approach is philosophical, but in general he assails the current tendencies. He sees the emphasis on prediction of school performance as antithetical to education and as providing information of little value to educators. Information should be used as an aid in "placement decisions," rather than as an aid to "selection decisions"; that is, information should be gathered and reviewed with the idea of finding programs to meet the individual needs of the child rather than estimating his ultimate level of performance. The question to be asked is not, "Which method is better?" but "Which method is better for *whom*?"

Several of the problems of the state of the art are also delineated. Reynolds takes strongest exception to placements by intelligence tests, which often prove to be self fulfilling prophecies insofar as they influence motivation. Children are placed in special programs on the basis of tests they may never be able to pass, even though the tests have been shown to be, at best, poor predictors of performance or achievement. Furthermore, the tests give no indication of what treatments ought to be presented.

Reynolds believes human potential is not fixed; yet our manner of approaching research tends to substantiate notions of limited capacity. He strongly supports the development and implementation of new methods that can help overcome the limited expectations we have. His principal goal is to orient future research toward a different conception of human capacity.

Comment

Reynolds' remarks are as relevant today as they were in 1963. The observation that educational production functions should be student-specific was not generally addressed in the educational research literature until the late 1960's.

COMMENT BY PRESENT AUTHOR

Reynolds rightly equates the traditional predictive model with selection-rejection decisions and proposes an interactive model (interactions between treatments and individual characteristics) as appropriate for the placement decisions typical of schools. The importance of this distinction is of growing importance as public schools accept an increasing number of handicapped children who were previously rejected. More attention needs to be placed on components of the instructional situation and variables which influence learning, both as concerns research and teaching.

Reynold's criticism of the use of IQ test scores in program placement is extremely relevant given the widespread practice as noted in the present survey.

APPENDIX RB

Reynolds, M. C. A framework for considering some issues in special education. ***Exceptional Children*, 1962, *28*, 367-370.**

Program delivery systems are arranged by Reynolds according to the intensiveness of service which, implicitly, is related to the severity of the handicapping conditions. The author establishes a pyramid in which the base is the regular classroom. At higher levels, the same classroom is supplemented, respectively, by the services of a consultant, another teacher, and a resource room. Part time and full time special classes are located in the middle of the pyramid. At the top are found the special institutions including day schools, residential schools, and hospitals or treatment centers.

Reynolds advocates extensive flexibility and frequent review so students are moved up the hierarchy only as far as necessary and are returned as soon as feasible. Coordination is often lacking because the jurisdiction for instructional programs at the lower service levels is almost invariably separate from the health, welfare, and correctional authorities who administer the upper levels. Furthermore, the middle levels are inadequately served as a result of the undefined responsibilities of the various agencies involved.

Reynolds also urges a wider range of services be offered, thereby allowing easier movement of children from one level to another. The practices of labeling children and funding according to labels preclude such flexibility. He believes that tying funding to professional personnel, thus leaving them flexible to provide a variety of services, is preferable to funding on a per classroom or per pupil basis. In short, programs and personnel should be classified, not children. It is the subtle differences between individuals, rather than the gross similarities of their handicaps, that determine their learning needs.

Comment

As a means of conceptualizing the problem of service delivery models, Reynolds' seminal article outlines the foundation for most of the current literature.

(Above taken from Bernstein et. al.(1976))

APPENDIX RC

Authors:	Rossmiller, Richard A. and Moran, Thomas H.
Title:	Cost differentials and cost indices: The assessment of variations in educational program costs.
Publisher/Journal:	In National conference on school finance, School finance in transition. Gainsville Fl: National Educational Finance Project and the Institute for Educational Finance.
Date:	1973
No. of pages:	15

SUMMARY

The following summary and comments may be found in Bernstein et al. (1976).

This study is one of a number of special studies conducted for the Delaware State Board of Education in the area of school finance. The study was financed jointly by the Delaware State Board of Education and the National Education Finance Project.

All of Delaware's 26 school districts were included in the study. Since current operating expense data in Delaware were not available by category or subcategory of program, the researchers had to devise methods for allocating current operating expenses to program levels and between "special" and "regular" education programs. These methods are fully explained in the document. It should also be noted that most districts did not offer programs in all categories. For example, only five Delaware districts offered TMR programs in 1970-71.

The researchers developed cost indices for regular, handicapped, and vocational-technical programs. Average cost indices were computed for the following handicap program areas: EMR, TMR, orthopedically handicapped, blind or partially sighted, deaf or partially deaf, socially or emotionally maladjusted, and learning disabled.

The authors conclude the study with a section devoted to their opinions on the appropriate use and the potential drawbacks of cost indices. Cost indices, in their view, are helpful for statewide planning purposes. However, they caution the reader against the indiscriminate use of such indices, pointing out that (a) cost indices are simply averages, (b) cost indices may not differentiate between various types of delivery systems, (c) cost indices reflect current educational practice and not what could or should be done, and (d) costs for identical programs may differ between districts for a variety of reasons.

The following tables and details were extracted for the purpose at hand.

TABLE 1 (RC 1)

TYPOLOGY OF EDUCATIONAL PROGRAM STRUCTURE

- I. Preschool Programs
  - A. Early Childhood Special Education
  - B. Kindergarten
- II. Elementary Programs
  - A. Regular Program
  - B. Programs for the Intellectually Gifted
  - C. Programs for the Intellectually Handicapped
    - 1. Programs for the Educable Mentally Retarded
    - 2. Programs for the Trainable Mentally Retarded
  - D. Programs for Students with Learning Disabilities
  - E. Programs for the Emotionally Disturbed and Socially Maladjusted
  - F. Programs for the Speech Handicapped
  - G. Programs for the Visually Handicapped
    - 1. Programs for the Partially Sighted
    - 2. Programs for the Blind
  - H. Programs for the Auditorily Handicapped
    - 1. Programs for the Hard of Hearing
    - 2. Programs for the Deaf
  - I. Programs for the Orthopedically Handicapped
  - J. Programs for Students with Multiple Handicaps
- III. Secondary Programs
  - A. Regular Program
  - B. Programs for the Intellectually Gifted
  - C. Programs for the Intellectually Handicapped
    - 1. Programs for the Educable Mentally Retarded
    - 2. Programs for the Trainable Mentally Retarded
  - D. Programs for Students with Learning Disabilities
  - E. Programs for the Emotionally Disturbed and Socially Maladjusted
  - F. Programs for the Speech Handicapped
  - G. Programs for the Visually Handicapped
    - 1. Programs for the Partially Sighted
    - 2. Programs for the Blind
  - H. Programs for the Auditorily Handicapped
    - 1. Programs for the Hard of Hearing
    - 2. Programs for the Deaf
  - I. Programs for the Orthopedically Handicapped
  - J. Programs for Students with Multiple Handicaps
  - K. Occupational Education Programs

TABLE 2 (RC 2)

TYPOLOGY OF EDUCATIONAL PROGRAM DELIVERY SYSTEMS

- I. Regular Classroom Organization
  - A. Regular Classroom
  - B. Regular Classroom with Special Consultant
  - C. Regular Classroom with Itinerant Teacher
  - D. Regular Classroom with Resource Room
- II. Special Classroom Organization
  - A. Part-Time Special Education
  - B. Full-Time Special Education
- III. Special Day School
- IV. Residential School
- V. Homebound or Hospitalized

TABLE 5 (RC 3)

COST INDICES FOR SPECIAL EDUCATION PROGRAMS

	A		*B*		*NEFP**	*C***				*D****
Preschool Programs	—		1.05		—	—		—		—
Early Childhood	—		—		—	—		—		
Kindergarten	—		1.05		—	—		—		
Elementary Programs	1.71	(K-6)	1.70	(1-8)	—	2.21	(1-6)			
Gifted	—		1.88		1.13					
Educable Mentally Retarded	1.48		1.68		1.92					
Trainable Mentally Retarded	1.66		1.73		2.20					
Learning Disabilities	2.31		1.52		2.50					
Socially & Emotionally Maladjusted	1.97		1.60		3.70					
Speech Handicapped	—		1.62		1.25	1.36				
Blind	1.83		—		3.48					
Deaf	—		1.65		3.15					
Partially Sighted	1.83		1.79		3.48					
Hard of Hearing	3.03		1.62		3.15					
Orthopedically Handicapped	1.75		1.54		3.26					
Multiple Handicapped	—		1.65		2.80					
Secondary Programs	1.51	(7-12)	1.80	(9-12)		2.30	(7-9)	2.71	(10-12)	1.88
Gifted	—		1.49		1.13					
Educable Mentally Retarded	1.35		1.49		1.92					
Trainable Mentally Retarded	1.24		1.48		2.20					
Learning Disabilities	2.25		—		2.50					
Socially & Emotionally Maladjusted	1.96		1.35		3.70					
Speech Handicapped	—		1.91		1.25	1.52		1.57		
Blind	2.48		—		3.48					
Partially Sighted	2.48		1.70		3.48					
Deaf	—		1.22		3.15					
Hard of Hearing	3.05		1.25		3.15					
Orthopedically Handicapped	1.33		—		3.26					
Multiple Handicapped	1.65		—		2.80					
Occupational Programs	1.60		1.55							

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* Elementary & secondary levels were not distinguished and the base cost was 1-12 inclusive.
**Elementary, middle, & secondary levels were distinguished and the base cost was the elementary level.
***Elementary & secondary levels were not distinguished and the base cost was the elementary level.

In the planning of a study, the degree of detail adopted in the program structure (Table 1) and the program delivery systems (Table 2) imposes very high requirements on the data collection phase (Comment e.g., Require larger sample of school districts and more detailed cost information).

Because of the difficulties inherent in obtaining expenditure data organized by educational program and type of delivery system, in the more recent efforts in the States it has generally been necessary to resort to procedures for allocating expenditures which are not comparable to those used in the national project. The generally less detailed systems for allocating expenditures in the state studies probably understate the true cost differentials and cost indices. Also, the districts in the national sample were selected as being exemplary in their programming and which probably represented districts with among the highest per pupil expenditures for special educational programs in the state. Other sources of variability (e.g., choice of base program for computing cost indices, definitions of special educational programs and exceptionalities) also serve to undermine the comparability of the state and national studies. Table 5 presents cost indices from a number of studies.

The availability of accurate cost indices for the state as a whole should permit more accurate estimates of the amount of revenue needed to provide adequately for the special educational needs of all pupils. However, the cost index as average cost is not a useful basis for allocating funds.

As cost indices reflect current educational practice, they in no way reflect the efficacy or efficiency of the educational programs, and provide no information as to how wisely and efficiently funds are being expended for either regular or special educational programs.

APPENDIX RD

Author: Rossmiller, R.A., Hale, J.A. and Frohreich, L.E.

Title: Educational programs for exceptional children: Resource configurations and costs (Special study no. 2)

Publisher/Journal: National Educational Finance Project; Department of Educational Administration, University of Wisconsin: Madison.

Date: 1970

No. of pages: 319

Eric No: EA 003 539

SUMMARY

Note: This summary and comments may be found in Bernstein et al. (1976)

This document reports the results of the seminal NEFP study of special education that spawned numerous other state studies, dissertations, and summary articles. The regular and special education programs in selected districts of five states (Wisconsin, Florida, California, Texas, and New York) were examined. Costs were allocated to program areas (i.e., handicapping conditions) by expenditure components (e.g., administration, clerical, operations). The authors describe the variety of services and service delivery systems available, but they make no attempt to differentiate the costs of each.

To avoid the instability of time- and place-bound gross expenditures, the researchers created a cost index that relates the ratio of the costs of special education to those of regular education. Wide variations occurred within a district for different programs and among districts for similar programs. With the resulting cost data, they projected prevalance rates, population trends, and economic factors to arrive at an estimate of needs in the next decade. The study concludes with a brief summary of the trends likely to affect special education in the future.

Comment

The NEFP methodology imposes some limitations on subsequent research into special education. The researchers made a major assumption when they selected a cost index to avoid instability resulting from geographical variations and changes over time. In fact, gross expenditures may be corrected for such factors fairly simply. Cost indices, on the other hand, may vary as a result of differences in the costs of regular education rather than differences in the cost of special education, and these variations are not readily apparent without knowing two levels of gross expenditures (both special and regular). Furthermore, since the major portion of the costs of education are salaries, there will be a tendency—as with most services—for costs to increase faster than the general economy. As a result, the more labor-intensive services (e.g., special education) should experience a faster rate of increase, which will destabilize the index over time.

The following were extracted for the purpose at hand. A table of contents similar to the original one is presented to facilitate topic search.

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CH. 1 INTRODUCTION

Program Quality

An extensive review of special education programs in a previous publication of the National Educational Finance Project[1] uncovered little evidence documenting the efficacy of the various programs.

Concerning cost studies in education, Paul Mort and his associates[2] conducted studies over a thirty-year period in their search for the "cost-quality" relationship. These studies have provided empirical evidence to support the logical assumption that the quality of education provided to pupils is directly related to the amount of money expended for each pupil. On the basis of these studies, it would appear that the correlation between expenditure level and school quality, as measured by various instruments developed and refined by Mort and his colleagues, was rather consistently in the neighborhood of .60.

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[1] Rossmiller, Richard A., Dimensions of need for educational programs for exceptional children. In Dimensions of educational need, edited by R.L. Johns, Kern Alexander, and Richard A. Rossmiller, Gainsville, Fla: National Educational Finance Project, 1969, pp. 70-85.

[2] Mort, Paul R., Reusser, Walter C., and Polley, John W. Public school finance. 3rd ed.; New York: McGraw-Hill, 1960, pp. 77-89

Ch. 2: Design of the Study

The purpose of this chapter is to provide a description of the design of the study and the procedures which were employed so that (1) those who might wish to replicate the study may do so, and (2) those who wish to make use of our findings will understand how they were obtained.

Selection of the sample

Six[3] persons recommended as having broad knowledge of the educational program for exceptional children across the United States formed a panel. Each member was requested by mail to identify "the five states that, on the basis of your knowledge and judgment, are doing the most outstanding job of providing high quality educational programs for exceptional children".

The primary selection criterion was the number of nominations each state received from the panel members. However, it was deemed important that, insofar as possible, the sample should be structured to include states which reflected varying social, economic, and demographic conditions as well as being dispersed geographically. Among the thirteen states identified, California, Florida, New York, Texas and Wisconsin were selected. Each of these states was nominated by at least two of the six panel members[4] and the five states are geographically dispersed. All five states are heavily populated (ranking between 1 and 16) with corresponding large school enrollments. They vary considerably, however, in population per square mile (from 42 to 378 persons), in per cent of population that is urban (from 64 to 86%), and in per capita personal income (from $2,744 to $3,759).

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[3] Nine persons were approached, but only six agreed to participate.

[4] No. of nominations by panel members: California: 6, Wisconsin: 5, Florida: 3, New York: 2, and Texas: 2.

Personnel in each of the five state departments of education assisted us in identifying the sample of school districts (or intermediate agencies) to be studied in their state which provided, in their judgment, high quality comprehensive educational programs for exceptional children. Of the twenty-seven school districts contacted, one declined to participate, and two were dropped in the course of the study because the necessary data on personnel expenditures in exceptional child programs was unavailable; twenty-four districts comprised the final sample.

A small sample of state-operated residential schools for exceptional children was also identified.

Data instruments: Six data forms and an interview-observation protocol were developed, field tested, and modified before data collection was initiated. Except for Rochester, New York, where fiscal data for the 1967-68 school year were used, all data obtained were for the most recently completed full school year, 1968-69, and for the 1969 summer session, if one was held.

The data forms were as follows:

1) Form A - Pupil Personnel Inventory.
2) Form B-1 - Exceptional Program Staff Personnel Inventory.
3) Form B-2 - Regular Program Staff Personnel Inventory.
4) Form C - Exceptional Program Materials and Equipment Inventory.
5) Form D - General Information
6) Special Transportation Costs.

The categories of exceptionality were identified and defined in Form A by the researchers: [5]

- Intellectually gifted - special programs designed specifically to provide educational opportunities for students identified as being academically talented.
- Intellectually handicapped - special programs designed specifically for students identified as being mentally retarded and unable, without special help, to benefit from the regular school program.
- Auditorily handicapped - special programs designed specifically for students identified as being hard-of-hearing or deaf.
- Visually handicapped - special programs designed specifically for students identified as being blind or partially sighted.
- Speech handicapped - special programs designed specifically for students identified as having speech defects (Language disorders, i.e. problems in the acquisition and use of a language system, were reported in the category Special Learning Disorders).
- Physically handicapped - special programs designed specifically for students identified as having physical disabilities resulting from congenital defects, disease or accident. (Students in special programs because of cardiac conditions, diabetes, allergies, etc. were included here).
- Neurological and/or Mental disorders - special programs designed specifically for students identified as having disabilities which arise from brain injuries or inadequate development of the central nervous system. Common to this category are cererbral palsy, epilepsy, encephalitis, etc.
- Emotionally disturbed - special programs designed specifically for students who exhibit severe and frequent maladaptive behavior which seriously reduces their attention and learning.

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[5] The categories were compatible with those employed by the U.S. Office of Eudcation in its recent data projects.

- Special learning disorders - special programs designed specifically for students who exhibit a severe disorder in one or more of the processes involved in understanding or using spoken or written language.
- Multiple handicapped - special programs designed specifically for students who suffer from more than one handicap and who have not already been reported in another category.

The so-called "compensatory" educational programs for socially, economically, and/or culturally disadvantaged children did not fall within the scope of this study.

Analysis of the data:

Given that case studies composed the data, analysis consisted essentially of descriptions of the programs - both narrative and statistical. The school districts which comprised the sample were not randomly chosen, and hopefully is representative of those relatively few school districts in the United States which are providing generally comprehensive and reasonably adequate educational programs for exceptional children. Generalizations from this sample are unwarranted, except insofar as the sample may be viewed as representing the "best current practice" in public school programs for exceptional children.

Presentation of data:

To provide concise descriptions of the sources of cost differentials in educational programs for exceptional children, the expenditure components were grouped in accordance with the Expenditure Index suggested by Buchmiller[6] based on his principal component analysis of line-term expenditures reported by 371 Wisconsin K-12 school districts for the 1967-68 school year. Buchmiller's recommended broad expenditure categories were Management, Instruction, Instructional Support, Institutional Operation, Acquisition of Facilities, and Equipment and Services. Complete data on total expenditure and expenditure per pupil in each program for each of the twenty-four sample school districts will be found in Appendix

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[6] Archie A. Buchmiller, "Analysis of Expenditures in Wisconsin School Districts for the Development of An Expenditure Index"(published PhD. dissertation, University of Wisonsin, (1970).

In addition to detailed and summarized cost data on the components of current operation, data are provided with regard to cost of transportation per pupil transported and cost of acquisition of facilities and equipment (capital outlay and debt service). Also, the teacher-pupil ratio in each program and square feet of classroom space per pupil in each program are reported.

Ch. 3: Programs and Program Costs in Public School Districts and Residential Schools

Three primary data sets were analysed: (1) the interviews with persons (teachers and administrators) directly involved in providing services for exceptional children, (2) materials produced by school districts describing the needs, objectives and activities of their programs for exceptional children, and (3) the project-designed data set soliciting information relative to enrollments, staffing, financing and other resource inputs relating to programs for exceptional children provided by the sample districts.

Before moving to a discussion of each program category, a brief discussion of the concept of cost differentials employed in our program analysis is necessary. This study was designed in such a manner that indirect cost accounting techniques could be used. Recognizing that cost differences are time-bound and therefore of limited projective use, the cost-index was computed by dividing the cost per pupil of a special program by the cost per pupil of the regular educational program provided by the district. This cost index is not time-bound relative to the normative and changing demands upon a school district's resources.

The normative funding practices of a particular school district would not cause the cost index to vary significantly over time. However, a significant change in the district's staffing pattern (e.g. lower pupil-teacher ratios, employment of teacher aides, etc.)could lead to a significant change in the cost index.

It is noteworthy that other non-budgeted resources often influence educational programming; this seems to be especially true among programs for exceptional children (e.g. donations). Our visitations to each district in the sample revealed various non-budgeted resources which augment special education programs. (Comment: No estimation of these non-budgeted resources were presented).

Section A. Public School Programs for Exceptional Children

(N.B. Programs for the intellectually gifted have not been extracted as they are beyond the scope of the present study. Programs for children homebound or hospitalized have also been overlooked ; the authors indicated that the cost indices computed were not comparable to those of other programs because of their inability to compute full-time equivalency enrollments.)

Programs for
Educable Mentally Retarded

Children whose intelligence quotients are within the range of 50 to 70 are generally considered to comprise the educable mentally retarded population. Florida uses an IQ range of 55 to 75 for student identification; New York provides that the intellectual capacity of potential candidates for the EMR program shall fall lower than 1.5 standard deviations below the mean of the general population and, in the considered opinion of the placement committee, the child cannot benefit from the regular program but may be expected to benefit from a special educational program. (The New York criteria for the Trainable Mentally Retarded sets the lower intelligence limit for EMR identification and are presented with the TMR program).

The objectives of programs for educable mentally retarded pupils emphasize development of social adjustment and relationships, physical competencies, desirable health habits, and the attainment of vocational proficiency. The rationale seems to be that the operational objectives of the program will approximate the objectives of the regular program but will be pitched at a lower level--especially relative to academic competencies. School districts reported that considerable merit lay in organizing each academic area in a developmental sequence consistent with the characteristics of educable mentally retarded children.

The curriculum is implemented through concrete-tactile activities which develop cognitive, affective and conative competencies. The program assumes a heavy vocational orientation at the secondary level which typically is manifested in a work-study configuration. The purpose of the work-study program is to provide retarded pupils (over 16 years of age) with employment experience as an integral part of their secondary school curriculum. The thrust of the work-study program is directed toward developing attitudes, skills, and habits which will benefit the youth in a future work situation.

Programs for elementary age EMR students are not unlike those observed in high quality regular elementary programs. Specifying expected behaviors and developing lists of activities designed to bring about those behaviors seem to pervade existing program development ideology.

The work-study program for secondary students is generally organized into one-half day of study and one-half day of on-the-job work experience. Some school districts provide both morning and afternoon work experience opportunities which tends to expand the number of employment opportunities by more than a factor of two.

The idealized pupil-teacher ratios, as expressed by teachers, are given in Table 3.3. The statistical mode of all responses is presented for each of the four programming levels.

New York regulations require that classes for EMR students at the elementary level shall not exceed fifteen and at the secondary level shall not exceed eighteen. Further, each class should be organized so that the ages of participating students will not vary more than three years. The observed pupil-teacher ratios in all districts in all states visited tended to conform with the New York class size regulations.

There seemed to be little attempt to integrate EMR pupils into regular classes at the elementary school level. Quite the contrary. We noted a trend toward separating the EMR pupils into special instructional units. However, fusion was practiced to a greater extent at the secondary level, where it was difficult to identify special classes for EMR pupils except for the special work-study programs identified above. In small school districts the work-study programs seem to provide for a mixture of both EMR and compensatory pupils.

Student identification for the EMR program normally begins at grade one, although some districts reported tentative identification at the kindergarten level. Criteria for admission, re-evaluation, and discharge include assessing each candidate relative to the following dimensions:

1. Physical – the child must be toilet trained, ambulatory to the extent that no undue risk to himself or others exists when engaged in daily activities, and must possess health conditions generally required to benefit from special class activities.

2. Psychological – the child must be able to communicate his wants and to understand simple directions, be socially and emotionally developed to the extent that he does not present an undue risk to himself or the physical well-being of others, and be able to benefit from the special learning situations provided by the program.

The assessment of the above dimensions provides for a case-study of each candidate which is presented to a placement committee. Initiation of a case-study may be proposed by a special class teacher, the building principal, a district psychologist, or a member of the placement committee. The following documents are made available to the placement committee:

1. recent medical examination,
2. educational evaluation by teacher and/or school counselor,
3. individual psychological examination, and
4. parent application or authorization for placement.

Although some states require an annual re-evaluation of each student, normative practice among school districts seems to provide for individual re-evaluation of EMR pupils every two or three years.

TABLE 3.3 (RD 1)

IDEALIZED NUMBER OF PUPILS PER TEACHER IN THE EMR PROGRAM

Level	Ages	Number of Pupils
Primary	6 - 9	9
Intermediate	10 - 12	11
Middle (Junior High)	13 - 15	14
Secondary	16 - 19	17

Facilities provided for EMR programs are similar to those provided for regular programs. Most EMR programs we observed were in classrooms located in regular schools. The principal variance we observed was the greater amount of space provided per pupil, brought about primarily by lower pupil-teacher ratios operating in EMR classes using classrooms which were the same size as those used in regular programs.[5] Some differences were noted in the availability of supplies and equipment between the EMR and regular programs. Less variance was noted in kind than in quantity, i.e., both EMR and regular programs use similar equipment (e.g., overhead projectors) but more often than not, the EMR classroom had equipment available on a permanent basis whereas the regular classrooms were sharing the more costly equipment with two or more other classrooms. Extensive utilization of audio-visual materials was observed in elementary EMR programs.

Teacher-produced evaluation designs and instruments are used for pupil assessment; program evaluation designs seemed to be non-existent. Generally, students who complete the EMR program are awarded a certificate and participate in the regular graduation exercises of the school district.

Table 3.4 presents the computed per pupil costs for the Educable Mentally

TABLE 3.4 (RD 2)

PER PUPIL COST INDICES OF THE PROGRAMS FOR THE EDUCABLE MENTALLY RETARDED

District	A Exceptional Program Cost Per Pupil	B Regular Program Cost Per Pupil	C Differential (A – B)	D Cost Index (A / B)
A	$ 1,289	$ 482	$ 807	2.67
B	708	509	199	1.39
C	1,634	1,114	520	1.47
D	875	477	398	1.83
E	1,012	889	123	1.14
F	1,414	600	814	2.36
G	1,689	795	894	2.12
H	826	484	342	1.71
I	987	468	519	2.11
J	1,412	860	552	1.64
K	933	653	280	1.43
L	1,523	783	740	1.94
M	1,543	690	853	2.24
N	1,034	734	300	1.41
P	1,645	828	817	1.99
Q	910	480	430	1.90
R	1,342	656	686	2.05
T	911	615	296	1.48
U	1,844	1,193	651	1.55
V	2,358	734	1,624	3.21
W	1,863	647	1,216	2.88
X	1,197	654	543	1.83
N=22	ΣX=28,949	ΣX=15,345	ΣX=13,604	ΣX=42.22
MEAN	$ 1,316	$ 698	$ 618	1.92
MEDIAN	$ 1,316	$ 655	$ 548	1.87

Retarded programs included in the sample (Column A) as well as the associated regular program costs (Column B). Column D represents the cost index computed for each program by dividing the per pupil cost of each EMR program by the respective district's per pupil cost of the regular program. The MEAN per pupil cost index was found to be 1.92 and the MEDIAN per pupil cost index was found to be 1.87. It may be interpreted that, on the average, the EMR programs included in this sample expend 92 per cent more per EMR pupil than they do for each regular pupil. The MEDIAN cost index for the EMR program indicates that the over-all expenditure trend may be a few percentage points less than the MEAN expenditure level.

Table 3.5 compares the per pupil expenditures by function for school districts having the highest, median, and lowest per pupil expenditure ratios for the Educable Mentally Retarded program. The per pupil cost was determined by function and the cost index was then computed for each functional expenditure for the special programs by dividing the per pupil cost for each function of the special program by the per pupil cost determined for each function of the regular program. This means, for example, that the per pupil expenditure for management of the EMR program in the highest ratio district is 3.21 times as great as the per pupil expenditure for management of the regular program. Obviously, the programs enrolling fewer pupils suffer to some extent from dis-economies of scale. However, one must remember that "more of everything" typically is provided children enrolled in these EMR programs – more program supervision, more clerical support (to accommodate increased volume of paper work necessitated by individual case studies and processing), lower pupil-teacher ratios, more supplies and equipment, more psychological services and curriculum programming ("Other" category under Instructional Support), more space per pupil (and consequently more operational and maintenance costs), more health services and more comprehensive transportation policies.

One must remember that the sample districts were selected because of their high quality programs and the data provided in Table 3.5 cannot be used to compare high expenditure districts with low expenditure districts or high quality programs with low quality programs. Each of the school districts in the sample is recognized as a leader among school districts providing services for exceptional children, and educational planners would do well to emulate the services offered by any of the twenty-two districts reporting on EMR programs. We are not prepared to assert that a school district which expends 3.21 times as much per pupil in its EMR program as it does per pupil in its regular program will have a higher quality program than if it were to expend 1.41 times as much as the regular program per pupil cost. However, we are prepared to say that the odds of obtaining a high quality program by expending within the limits observed are very good – we observed twenty-two school districts who were doing it.

Other resources identified as being provided to special programs for EMR students include civic club donations to cover expenditures for special events (e.g., "fun-parties" and educational trips) or instructional (training) equipment. Extensive services are provided by local employers who hire secondary age EMR pupils in cooperation with the work-study program. When one recognizes that the probability is very high that many EMR pupils would "drop-out" of high

TABLE 3.5 (RD 3)

EXPENDITURE BY FUNCTION FOR SCHOOL DISTRICTS WITH HIGHEST, MEDIAN AND LOWEST PER PUPIL EXPENDITURE RATIOS FOR THE EDUCABLE MENTALLY RETARDED

	School District					
	V (Highest)		Q (Median)		N (Lowest)*	
Category	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index
Management						
Administration	$ 131	3.12	$ 31	1.30	$ 64	1.60
Clerical & Secretarial	77	1.87	18	1.00	46	1.36
Instruction						
Teachers	725	1.85	598	1.25	490	1.53
Teacher Aides	82	NA	---	----	---	----
Instructional Support						
Supplies & Equipment	72	1.33	15	1.09	21	1.11
Guidance & Counseling	9	1.00	9	1.00	29	3.58
Other	209	23.20	19	1.46	28	9.28
Institutional Operations						
Operation & Maintenance	250	3.33	141	2.94	81	1.50
Fringe Benefits	71	2.02	---	----	63	1.46
Other	52	1.00	49	1.00	168	1.00
Services						
Health	95	19.05	5	1.00	2	1.00
Food	1	1.00	14	1.00	30	1.00
Transportation						
Cost/Pupil in ADM	584	30.73	11	11.00	12	1.00
TOTAL – Current Operation	$2,358	3.21	$910	1.90	$1,034	1.41
Transportation						
Cost/Pupil Transported	$ 584	13.27	$112	4.86	$ 25	1.00
Capital Outlay/ADM	9	1.00	15	1.00	28	1.00
Debt Service/ADM	12	1.00	21	1.00	43	1.00
Teacher-Pupil Ratio	1:15	----	1:13	----	1:14.5	----
Sq. Ft. Classroom Space Per Pupil	100	----	88	----	45	----

NA – Not Available

* – Functions could not be computed for the two lowest cost index districts; therefore, the third lowest cost index district was used for this program.

school if they were not provided an alternative to comprehensive academic programming, and that many of them would subsequently enter the jobless and welfare stream, one can further appreciate the significance of community cooperation with the work experience dimension of the EMR program.

Programs for Trainable Mentally Retarded

Children whose intelligence quotients are determined to be within a range of approximately 35-50, and who are assessed to be incapable of profiting from special programs for the educable mentally retarded, are provided special programs designed to promote social adjustment and to develop the basic skills needed for survival. Florida establishes an IQ range of 35-55 for the trainable category; New York provides that the general intellectual capacity must be lower than three standard deviations below the mean of the general population.

The objectives of training programs for trainable mentally retarded (TMR) children emphasize basic survival skills designed to promote individual acceptance, social adjustment, and economic usefulness in the home and within a sheltered work environment. When one considers that TMR youth often can neither tie shoelaces nor control normal body functions at age 12, one can begin to realize the magnitude of the educational programming required for the TMR program. Specific skill training includes: using bathroom facilities, proper selection of clothing, good eating habits, enjoying the company of others, using public transportation, and extensive motor skill development.

Program development seems to be directed toward techniques which will bring about basic survival behaviors at an earlier age. One technique, of course, is early identification of TMR children and provision of extensive Pre-Kindergarten level activities. Another contemporary practice is to encourage mothers of TMR children to donate their services on a regular (weekly) basis in the classroom. One program we observed in which mothers were assisting with the program activities provided a ratio of ten children to five adults. The older pupils are provided a sheltered employment experience if a sheltered workshop exists in the school district. The Santa Cruz County, California, program for TMR pupils was one of the most outstanding programs we visited and might well serve as a model for the 1980's. The alternative to the TMR program seems to be custodial institutional care, which is neither socially nor economically acceptable for the majority of the target population.

Idealized pupil-teacher ratios were expressed by teachers as eight pupils per teacher (with aide) at the elementary school level and ten pupils per teacher (with aide) at the secondary school level. New York regulations limit pupil-teacher ratios to ten pupils per classroom for children whose chronological age is less than twelve years and to twelve pupils per classroom for children whose chronological age is greater than twelve years. Most districts do not provide services for pupils beyond 18 years of age, although those with cooperative sheltered workshop arrangements often extend their services to pupils up to 21 years of age.

Grade level identification among TMR programs is virtually non-existent. However, identification of programs as primary, intermediate, and vocational serves to indicate the chronological age of the pupils. No programs were identified in which TMR students were fused into a regular program, nor was there any support for this practice among the professionals we interviewed.

Most school districts identify prospective candidates for the TMR program prior to the time they enter kindergarten through such means as referrals by physicians and parents, and through a school census. The criteria for admission, re-evaluation and discharge are similar to those employed in the EMR programs except that the indicators vary (e.g., the individual I.Q. score is less for placement into a TMR program than for placement into an EMR program). The assessment typically includes medical, psychological, educational, and social dimensions.

Facilities for TMR programs are normally provided in separate special schools. The self-contained classrooms provide a homelike environment for training purposes (e.g., bedroom, kitchen, etc.). One district we visited used a duplex in a residential area to house two TMR classes. Extensive use is made of playground equipment to develop motor control at all program levels.

Evaluation of pupils consists essentially of teacher assessments of observed behavior modification. Few programs were observed that specify developmental behavioral objectives articulated through each level of programming. Systematic program assessment was found to be virtually non-existent. Program assessment dimensions were proposed in a 1966 publication of the California State Department of Education for those interested in developing evaluation designs for TMR programs.[6]

Table 3.6 displays our findings with regard to the costs associated with programs designed specifically for TMR pupils. Column A identifies the cost per pupil of the special program in each district; Column B identifies the cost per pupil of the regular program in each district; Column C represents the difference between special and regular program costs; Column D is the special program cost index computed by dividing the special program per pupil cost by the regular program per pupil cost. The MEAN expenditure for twenty-two reporting districts indicates that, on the average, those school districts providing programs for the trainable mentally retarded expend 2.20 times more per pupil in the special program than they expend per pupil in the regular program. The MEDIAN expenditure of 2.10 indicates that the expenditure trend among the reporting districts is 10 per cent less than the MEAN expenditure level. The expenditure range extends from a low cost index of 1.18 to a high cost index of 3.62.

Table 3.7 compares the expenditures by function for the school districts having the highest, median and lowest per pupil expenditure index for the TMR program. Again, the pupil-teacher ratio contributes significantly to the increased cost for teachers in the highest district, while the median district seems to be trading off expensive professionals for para-professional aides and supplies and equipment. Substantial variance also may be noted in the "Other" Instructional Support function (curriculum and psychological services) and in health and transportation services.

TABLE 3.6 (RD 4)

PER PUPIL COST INDICES OF THE PROGRAMS FOR THE TRAINABLE MENTALLY RETARDED

District	A Exceptional Program Cost Per Pupil	B Regular Program Cost Per Pupil	C Differential (A – B)	D Cost Index (A / B)
A	$ 871	$ 482	$ 389	1.81
B	636	509	127	1.25
C	1,840	1,114	855	1.65
D	562	477	85	1.18
E	2,321	889	1,432	2.61
G	2,629	795	1,834	3.31
H	875	484	391	1.81
I	1,032	468	564	2.21
J	1,701	860	841	1.98
K	911	653	258	1.40
M	1,550	690	860	2.25
N	1,411	734	677	1.92
O	1,553	549	1,004	2.83
P	2,078	828	1,250	2.51
Q	912	480	432	1.90
R	1,755	656	1,099	2.68
S	1,791	704	1,087	2.54
T	1,010	615	395	1.64
U	1,739	1,193	546	1.46
V	2,657	734	1,923	3.62
W	2,038	647	1,391	3.15
X	1,821	654	1,167	2.78
$N=22$	$\Sigma X = 33,693$	$\Sigma X = 15,215$	$\Sigma X = 18,578$	$\Sigma X = 48.49$
MEAN	$ 1,532	$ 692	$ 846	2.20
MEDIAN	$ 1,627	$ 655	$ 848	2.10

TABLE 3.7 (RD 5)

EXPENDITURE BY FUNCTION FOR SCHOOL DISTRICTS WITH HIGHEST, MEDIAN AND LOWEST PER PUPIL EXPENDITURE RATIOS FOR THE TRAINABLE MENTALLY RETARDED

	School District					
	V (Highest)		J (Median)		D (Lowest)	
Expenditure Category	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index
Management						
Administration	$ 134	3.19	$ 146	2.47	$ 29	1.00
Clerical & Secretarial	78	1.90	21	1.00	10	1.00
Instruction						
Teachers	1,019	2,59	380	0.80	308	1.12
Teacher Aides	79	NA	237	13.96	---	----
Instructional Support						
Supplies & Equipment	80	1.48	242	5.25	24	1.48
Guidance & Counseling	9	1.00	19	1.00	5	1.00
Other	216	23.96	3	1.00	13	1.00
Institutional Operations						
Operation & Maintenance	250	3.33	343	3.33	92	2.00
Fringe Benefits	56	1.60	70	2,80	---	----
Other	52	1.00	7	1.00	19	1.00
Services						
Health	99	19.70	2	1.00	1	1.00
Food	1	1.00	16	1.00	53	1.00
Transportation						
Cost/Pupil in ADM	584	30.73	215	2.98	8	1.00
TOTAL – Current Operation	$2,657	3.62	$1,701	1.98	$562	1.18
Transportation						
Cost/Pupil Transported	$584	13.27	$332	3.32	$40	1.00
Capital Outlay/ADM	5	1.00	15	1.00	2	1.00
Debt Service/ADM	12	1.00	145	1.00	78	1.00
Teacher-Pupil Ratio	1:10.2	----	1:17	----	1:22	----
Sq. Ft. Classroom Space Per Pupil	100	----	100	----	60	----

NA – Not Available

Programs for the Auditorily Handicapped

For students mildly hard of hearing, rehabilitative procedures vary from advantageous seating in the regular classroom, to instruction in speech reading by itinerant teachers, to speech therapy provided periodically in a resource room located within the child's school. Treatment is provided both on an individual basis and in group sessions. The idealized pupil-teacher load for group sessions, as expressed by itinerant therapists, was three children per therapist or six children per therapist and aide.

The idealized pupil-teacher ratio, as expressed by teachers of the deaf or severely hard of hearing was five students per teacher at the elementary level and twelve students per teacher at the secondary level, assuming the availability of a teacher's aide. In the two pre-kindergarten programs which were visited, the teachers suggested that three children per teacher (without aide) would be an optimum instructional group.

Table 3.8 (RD 6) PER PUPIL COST OF INDICES OF PROGRAMS FOR THE AUDITORILY HANDICAPPED

District	A Exceptional Program Cost Per Pupil	B Regular Program Cost Per Pupil	C Differential (A – B)	D Cost Index (A / B)
A	$ 965	$ 482	$ 483	2.00
B	533	509	24	1.05
C	1,613	1,114	499	1.45
E	1,090	889	201	1.23
G	4,671	795	3,876	5.88
H	2,322	484	1,838	4.80
I	2,141	468	1,673	4.57
K	1,125	653	472	1.72
M	2,107	690	1,417	3.06
P	2,419	828	1,591	2.92
Q	2,725	480	2,245	5,68
R	1,873	656	1,217	2.86
S	2,021	704	1,317	2.87
T	2,286	615	1,671	3.72
U	1,275	1,193	82	1.07
V	2,802	734	2,068	3.82
W	3,146	647	2,499	4.86
X	2,099	654	1,445	3.21
N=18	ΣX=37,213	ΣX=12,595	ΣX=24,618	ΣX=55.76
MEAN	$ 2,067	$ 700	$ 1,368	3.15
MEDIAN	$ 2,103	$ 655	$ 1,431	2.99

TABLE 3.5 (RD 7)

EXPENDITURE BY FUNCTION FOR SCHOOL DISTRICTS WITH HIGHEST, MEDIAN AND LOWEST PER PUPIL EXPENDITURE RATIOS FOR THE AUDITORILY HANDICAPPED

	School District					
	G (Highest)		P (Median)		C (Lowest)*	
Expenditure Category	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index
Management						
Administration	$ 195	4.64	$ 176	4.10	$ 75	1.00
Clerical & Secretarial	58	1.00	26	1.00	37	1.00
Instruction						
Teachers	2,275	5.52	823	1.98	700	1.31
Teacher Aides	84	42.00	---	----	---	----
Instructional Support						
Supplies & Equipment	153	4.92	46	1.59	123	6.15
Guidance & Counseling	2	1.00	17	1.00	29	1.00
Other	282	16.60	526	32.89	38	1.00
Institutional Operations						
Operation & Maintenance	612	7.20	[illegible]01	2.90	256	2.00
Fringe Benefits	202	4.20	387	2.74	232	1.12
Other	48	1.00	52	1.00	17	1.00
Services						
Health	7	1.00	12	1.00	16	1.00
Food	21	1.00	8	1.00	4	1.00
Transportation						
Cost/Pupil in ADM	732	33.27	145	145.00	86	21.50
TOTAL – Current Operation	$4,671	5.88	$2,419	2.92	$1,613	1.45
Transportation						
Cost/Pupil Transported	$732	8.51	$290	2.24	$172	1.31
Capital Outlay/ADM	8	1.00	8	1.00	3	1.00
Debt Service/ADM	---	----	2	1.00	107	1.00
Teacher-Pupil Ratio	1:4.5	----	1:9	----	1:12	----
Sq. Ft. Classroom Space Per Pupil	206	----	89	----	60	----

* – Expenditure functions could not be computed for the three lowest cost index districts; therefore, the fourth lowest cost index district was used for this program.

Programs for the Visually Handicapped:

Instructional programs were found to be organized in two modes: itinerant services and self-contained classrooms.

Idealized pupil-teacher ratios were expressed by teachers of partially-sighted children to be ten elementary pupils or fifteen junior high pupils per teacher. Partially-sighted senior high school pupils normally are either completely integrated into the regular program or receive occasional itinerant service.

The idealized pupil-teacher ratios expressed by teachers of blind children are given in the following table. The class-loads for secondary pupils represent daily itinerant teacher loads. Primary (pre-k thru Grade 3) and intermediate (Grade 4 thru Grade 8) class-loads assume the full-time services of a teacher aide.

One of the major facilitating objectives of programs for the blind is early identification and treatment. In several of the school districts we visited, blind children are offered services as early as eighteen months of age; by three years old the child receives mobility and social readiness training to enable the child to participate in a nursery

TABLE RD 8 : Idealized Number of Blind Pupils per Teacher

LEVELS	CLASS-LOADS
Primary Age	7
Intermediate Age	10
Secondary Age	12

program with normally-sighted four-year old children.

A common practice among school districts is to form area cooperatives to provide special education services whereby programs for exceptionalities with low prevalence rates may be provided on a tuition basis by one school district in the cooperative. In some states, intermediate educational agencies(e.g. New York's Boards of Cooperative Educational Services) assume responsibility for many of the programs for exceptional children - especially those with low prevalence rates such as programs for the blind.

TABLE 3.11 (RD 9)

PER PUPIL COST INDICES OF PROGRAMS FOR THE VISUALLY HANDICAPPED

District	A Exceptional Program Cost Per Pupil	B Regular Program Cost Per Pupil	C Differential (A – B)	D Cost Index (A / B)
B	$ 852	$ 509	$ 343	1.67
C	2,079	1,114	965	1.87
E	3,866	889	2,977	4.35
G	9,105	795	8,310	11.45
H	2,267	484	1,783	4.68
I	1,390	468	922	2.97
K	1,035	653	382	1.58
M	2,241	690	1,551	3.25
P	2,197	828	1,369	2.65
O	2,141	480	1,661	4.46
R	1,612	656	956	2.46
S	2,449	704	1,745	3.19
T	1,396	614	781	2.27
U	1,255	1,193	62	1.05
V	3,717	734	2,983	5.06
W	2,245	647	1,598	3.47
X	1,773	654	1,119	2.71
N=17	ΣX=41,620	ΣX=12,113	ΣX=29,507	ΣX=59.40
MEAN	$ 2,448	$ 713	$ 1,736	3.48
MEDIAN	$ 2,197	$ 656	$ 1,369	2.97

TABLE 3.12 (RD 10)

EXPENDITURE BY FUNCTION FOR SCHOOL DISTRICTS WITH HIGHEST, MEDIAN AND LOWEST PER PUPIL EXPENDITURE RATIOS FOR THE VISUALLY HANDICAPPED

	School District					
	G (Highest)		I (Median		D (Lowest)*	
Expenditure Category	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index
Management						
Administration	$ 986	23.48	$ 89	3.54	$ 80	1.36
Clerical & Secretarial	58	1.00	9	1.00	34	1.13
Instruction						
Teachers	5,556	13.48	649	2.26	669	1.68
Teacher Aides	306	153.00	215	NA	---	----
Instructional Support						
Supplies & Equipment	191	6.14	24	4.00	25	1.14
Guidance & Counseling	2	1.00	65	8.17	86	4.30
Other	17	1.00	94	18.89	11	1.00
Institutional Operations						
Operation & Maintenance	755	8.88	150	3.00	63	1.00
Fringe Benefits	425	8.85	---	----	37	1.00
Other	48	1.00	13	1.00	8	1.00
Services						
Health	7	1.00	19	9.69	1	1.00
Food	21	1.00	53	1.00	1	1.00
Transportation						
Cost/Pupil in ADM	733	33.31	10	1.00	20	5.00
TOTAL – Current Operation	$9,105	11.45	$1,390	2.97	$1,035	1.58
Transportation						
Cost/Pupil Transported	$733	8.52	NR	----	37	1.00
Capital Outlay/ADM	8	1.00	6	1.00	36	1.00
Debt Service/ADM	---	----	73	1.00	25	1.00
Teacher-Pupil Ratio	1:1.8	----	1:11.5	----	1:13.8	----
Sq. Ft. Classroom Space Per Pupil	267	----	90	----	NR	----

NR – Not Reported
NA – Not Available
* – Expenditure functions could not be computed for the lowest district; therefore, the second-lowest cost index district was used for this program.

Programs for the Physically Handicapped

Children identified as being within this target population are best characterized as orthopedically impaired; i.e. marked by deformities or crippling. Two categories of programs for the physically handicapped were identified: (1) day school educational and therapy services located at various attendance centers and (2) homebound and hospital educational and therapy services provided on an itinerant basis either at the child's home or at a local hospital. The latter are not included in our cost analyses of programs for the physically handicapped; a separate cost analysis was performed.

In the day school services, the principal objectives of the physical therapy are to develop competence in self-care within limits of individual abilities and to provide needed social adjustment. Physical therapists provide individualized services. The idealized pupil-teacher ratio in the academic aspect of the program as expressed by teachers was 12 pupils per teacher for instruction, assuming the availability of a teacher's aide and further assuming the target population to be normatively educable.

The primary objective of the homebound and hospital instructional programs is to keep children current relative to their placement in the regular program. Itinerant case loads were idealized at seven students per teacher per week.

TABLE 3.13 (RD 11)

PER PUPIL COST INDICES OF PROGRAMS FOR THE PHYSICALLY HANDICAPPED

District	A Exceptional Program Cost Per Pupil	B Regular Program Cost Per Pupil	C Differential (A – B)	D Cost Index (A / B)
B	$2,362	$ 509	$1,853	4.64
C	4,210	1,114	3,096	3.78
F	2,723	600	2,123	4.54
G	3,371	795	2,576	4.24
H	1,763	484	1,279	3.64
I	713	468	245	1.52
K	1,121	653	468	1.72
L	2,899	783	2,116	3.70
M	2,406	690	1,716	3.49
P	1,966	828	1,138	2.37
Q	2,113	480	1,633	4.40
R	1,308	656	652	1.99
T	1,392	615	777	2.26
V	2,743	734	2,009	3.74
W	1,872	647	1,225	2.89
N=15	ΣX=32,962	ΣX=10,056	ΣX=22,906	ΣX=48.92
MEAN	$ 2,197	$ 670	$ 1,527	3.26
MEDIAN	$ 2,113	$ 653	$ 1,633	3.64

TABLE 3.14 (RD 12)

EXPENDITURE BY FUNCTION FOR SCHOOL DISTRICTS WITH HIGHEST, MEDIAN AND LOWEST PER PUPIL EXPENDITURE RATIOS FOR THE PHYSICALLY HANDICAPPED

	School District					
	F (Highest)*		H (Median)		I (Lowest)	
Expenditure Category	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index
Management						
Administration	$ 182	3.50	$ 35	1.00	$ 50	2.00
Clerical & Secretarial	51	2.82	16	1.00	9	1.00
Instruction						
Teachers	512	1.52	1,217	3.88	334	1.16
Teacher Aides	436	NA	---	----	---	----
Instructional Support						
Supplies & Equipment	93	5.80	15	1.50	15	2.50
Guidance & Counseling	---	----	77	5.46	31	3.82
Other	526	43.81	251	251.00	63	13.50
Institutional Operations						
Operation & Maintenance	645	8.96	44	1.00	128	2.56
Fringe Benefits	122	6.10	---	----	---	----
Other	51	1.00	4	1.00	13	1.00
Service						
Health	2	1.00	68	13.50	2	1.00
Food	1	1.00	35	1.00	53	1.00
Transportation						
Cost/Pupil in ADM	102	9.27	1	1.00	10	1.00
TOTAL—Current Operation	$2,723	4.54	$1,763	3.64	$713	1.52
Transportation						
Cost/Pupil Transported	159	2.09	NA	----	NA	----
Capital Outlay/ADM	7	1.00	24	1.00	6	1.00
Debt Service/ADM	29	1.00	72	1.00	73	1.00
Teacher-Pupil Ratio	1:19.5	----	1:6	----	1:19.5	----
Sq. Ft. Classroom Space Per Pupil	269	----	30	----	77	----

NA - Not Available

* - Expenditure functions of the highest cost index district could not be computed; therefore, the second-highest cost index district was used for this program.

Programs for Speech Handicapped Children

The primary objective of these programs is to assist children with speech problems to communicate orally more effectively. Speech therapy is generally available to children classified in any program and is perhaps most appropriately regarded as a supplementary service.

Speech therapists normally provide individualized instruction and sometimes group instruction with four pupils. Caseloads were idealized to be between 50 to 75 pupil contacts per week.

TABLE 3.16 (RD 13)

PER PUPIL COST INDICES OF PROGRAMS FOR THE SPEECH HANDICAPPED

District	A Exceptional Program Cost Per Pupil	B Regular Program Cost Per Pupil	C Differential (A - B)	D Cost Index (A/B)
A	$ 604	$ 482	$ 122	1.25
B	594	509	85	1.17
D	552	477	75	1.16
F	753	600	153	1.26
G	932	795	137	1.17
H	1,027	484	543	2.12
I	541	468	73	1.16
J	954	860	274	1.11
K	959	653	306	1.47
L	1,012	783	229	1.29
M	793	690	103	1.15
N	799	734	65	1.09
O	639	549	90	1.16
P	987	828	159	1.19
Q	546	480	66	1.14
R	848	656	192	1.29
S	900	704	196	1.28
T	725	615	110	1.18
V	875	734	141	1.19
W	736	647	89	1.14
X	899	654	245	1.37
N=21	ΣX=16,675	ΣX=13,402	ΣX=3,453	ΣX=26.34
MEAN	$ 794	$ 638	$ 164	1.25
MEDIAN	$ 799	$ 653	$ 137	1.18

TABLE 3.17 (RD 14)

EXPENDITURE BY FUNCTION FOR SCHOOL DISTRICTS WITH HIGHEST, MEDIAN AND LOWEST PER PUPIL EXPENDITURE RATIOS FOR THE SPEECH HANDICAPPED

	School District					
	H (Highest)		T (Median)		N (Lowest)	
Expenditure Category	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index
Management						
Administration	$ 35	1.00	$ 50	1.07	$ 40	1.00
Clerical & Secretarial	16	1.00	18	1.00	34	1.00
Instruction						
Teachers	313	1.00	358	1.00	320	1.00
Teacher Aides	6	1.00	5	1.00	7	7.00
Instructional Support						
Supplies & Equipment	14	1.40	16	1.06	20	1.04
Guidance & Counseling	16	1.14	9	1.00	8	1.00
Other	513	513.00	122	3.58	59	19.81
Institutional Operations						
Operation & Maintenance	47	1.05	63	1.28	54	1.00
Fringe Benefits	---	----	22	1.22	45	1.04
Other	4	1.00	27	1.00	168	1.00
Services						
Health	27	5.34	1	1.00	2	1.00
Food	35	1.00	7	1.00	30	1.00
Transportation						
Cost/Pupil in ADM	1	1.00	27	1.00	12	1.00
TOTAL—Current Operation	$1,027	2.12	$ 725	1.18	$ 799	1.09
Transportation						
Cost/Pupil Transported	NA	----	$ 82	1.00	$ 25	1.00
Capital Outlay/ADM	24	1.00	38	1.00	28	1.00
Debt Service/ADM	72	1.00	64	1.00	43	1.00
Teacher-Pupil Ratio	1:14.6	----	1:65.5	----	1:131	----
Total Sq. Ft. Classroom Space	300	----	310*	----	NA	----

NA - Not Available

* - Total Space Available

Programs for Children with Special Learning Disorders

The category "Special Learning Disorders" includes the Neurologically Impaired, Minimum Brain Injury and Educationally Handicapped; the grouping is based on our observations of operational programs.

These remediation oriented programs are similar to programs for the educable mentally retarded except that one goal for children with special learning disorders is integrating then into the regular program; and one criterion for program placement is that no educable mentally retarded children are to be programmed with children having special learning disorders. Teachers of children identified as having special learning disorders idealized the pupil-teacher ratio as eight pupils per teacher in a self-contained classroom and no more than ten pupils per week for itinerant services.

TABLE 3.18 (RD 15)

PER PUPIL CO[illegible]NDICES OF PROGRAMS FOR SPECIAL LEARNING DISORDERS

District	A Exceptional Program Cost Per Pupil	B Regular Program Cost Per Pupil	C Differential (A - B)	D Cost Index (A - B)
A	$ 938	$ 482	$ 456	1.95
B	974	509	465	1.91
C	2,099	1,114	985	1.88
D	863	477	386	1.81
E	1,273	889	384	1.43
G	2,206	795	1,411	2.77
H	911	484	427	1.88
I	1,110	468	642	2.37
J	1,548	860	688	1.80
K	911	653	258	1.40
L	2,874	783	2,091	3.67
M	2,099	690	1,409	2.04
N	2,058	734	1,324	2.80
O	850	549	301	1.54
Q	2,495	480	2,015	5.20
R	1,569	656	913	2.39
S	2,622	704	1,918	3.72
U	1,988	1,193	795	1.67
V	2,729	734	1,995	3.72
W	1,945	647	1,298	3.00
N-20	ΣX-34,062	ΣX-13,901	ΣX-20,161	ΣX-49.95
MEAN	$ 1,703	$ 695	$ 1,008	2.50
MEDIAN	$ 1,757	$ 673	$ 854	2.16

TABLE 3.19 (RD 16)

EXPENDITURE BY FUNCTION FOR SCHOOL DISTRICTS WITH HIGHEST, MEDIAN AND LOWEST PER PUPIL EXPENDITURE RATIOS FOR THE SPECIAL LEARNING DISORDERS

	School District					
	Q (Highest)		I (Median)		K (Lowest)	
Expenditure Category	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index
Management						
Administration	$ 55	2.30	$ 36	1.44	$ 77	1.33
Clerical & Secretarial	18	1.00	9	1.00	33	1.10
Instruction						
Teachers	1,551	5.52	781	2.71	559	1.40
Teacher Aides	---	----	---	----	---	----
Instructional Support						
Supplies & Equipment	45	3.24	18	2.96	25	1.14
Guidance & Counseling	9	1.00	18	2.25	76	3.80
Other	84	6.46	41	8.18	11	1.00
Institutional Operations						
Operation & Maintenance	228	4.76	107	2.13	63	1.00
Fringe Benefits	---	----	---	----	37	1.00
Other	49	1.00	13	1.00	8	1.00
Services						
Health	5	1.00	24	12.00	1	1.00
Food	14	1.00	53	1.00	1	1.00
Transportation						
Cost/Pupil in ADM	437	437.00	10	1.00	20	5.00
TOTAL—Current Operation	$2,495	5.20	$1,110	2.37	$ 911	1.40
Transportation						
Cost/Pupil Transported	$ 547	23.78	NA	----	$ 37	1.00
Capital Outlay/ADM	15	1.00	6	1.00	36	1.00
Debt Service/ADM	21	1.00	73	1.00	25	1.00
Teacher-Pupil Ratio	1:5	----	1:12.7	----	1:16.4	----
Sq. Ft. Classroom Space Per Pupil	143	----	64	----	NA	----

NA - Not Available

Programs for Emotionally Distrubed Children

The category "Emotionally Distrubed" includes children who have been evaluated by a psychiatrist as emotionally distrubed and who have been identified as socially maladjusted or drug dependent. This grouping is based on our observations of operational programs.

The pervasive program goal is to return the child to the regular program. Special emphasis is placed upon behavior modification relative to the needs of the individual. Organizational configurations include both self-contained classrooms and resource rooms supplemented by itinerant specialists. Idealized pupil-teacher ratios as expressed by teachers are presented in table 3.20. However, one must realize that it is difficult to project an idealized classload without specifying behavior.

Placement in these programs is possible only if the intelligence level of a candidate is above that of the educable mentally retarded and the child must not present a hazard either to himself or to his peers.

TABLE 3.20. (RD 17)

Idealized Number of Pupils Per Teacher for the Emotionally Disturbed Program

	No of Pupils
Self-contained Class:	
Pre-kindergarten	4
Primary	5
Intermediate	6
Secondary	10
Itinerant/Caseloads:	
Elementary	12 per week
Secondary	15 per week

TABLE 3.21 (RD 18)

PER PUPIL COST INDICES OF PROGRAMS FOR THE EMOTIONALLY DISTURBED

District	A Exceptional Program Cost Per Pupil	B Regular Program Cost Per Pupil	C Differential (A - B)	D Cost Index (A/B)
A	$ 804	$ 509	$ 295	1.58
C	2,559	1,114	1,445	7.30
D	1,425	477	948	2.99
F	6,982	600	6,382	11.64
J	4,019	860	3,159	4.67
K	1,496	653	843	2.29
L	1,493	783	710	1.91
M	1,483	690	793	2.15
O	1,563	549	1,014	2.85
P	3,478	828	2,650	4.20
R	3,904	656	3,248	5.95
S	1,371	704	667	1.95
T	2,759	615	2,144	4.49
W	1,809	647	1,162	2.80
N=14	ΣX=35,145	ΣX=9,665	ΣX=25,460	ΣX=51.67
MEAN	$ 2,510	$ 692	$ 1,819	3.70
MEDIAN	$ 1,683	$ 655	$ 1,088	2.83

TABLE 3.22 (RD 19)

EXPENDITURE BY FUNCTION FOR SCHOOL DISTRICTS WITH HIGHEST, MEDIAN AND LOWEST PER PUPIL EXPENDITURE RATIOS FOR THE EMOTIONALLY DISTURBED

	School District					
	F (Highest)		O (Median)		L (Lowest)*	
Expenditure Category	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index
Management						
Administration	$ 416	7.99	$ 354	8.62	$ 86	1.62
Clerical & Secretarial	110	6.09	15	1.00	61	1.22
Instruction						
Teachers	3,433	10.21	862	2.67	811	2.15
Teacher Aides	---	----	---	----	---	----
Instructional Support						
Supplies & Equipment	128	7.99	27	1.08	67	1.85
Guidance & Counseling	9	1.00	13	1.00	26	1.73
Other	1,911	159.25	1	1.00	110	6.46
Institutional Operations						
Operation & Maintenance	652	9.06	213	3.00	175	1.56
Fringe Benefits	126	6.30	9	2.25	56	1.64
Other	51	1.00	43	1.00	24	1.00
Services						
Health	2	1.00	5	1.00	10	1.30
Food	1	1.00	1	1.00	52	1.00
Transportation						
Cost/Pupil in ADM	143	13.00	20	2.50	15	1.00
TOTAL—Current Operation	$6,982	11.64	$1,563	2.85	$1,493	1.91
Transportation						
Cost/Pupil Transported	143	1.83	39	0.69	51	1.00
Capital Outlay/ADM	7	1.00	2	1.00	18	1.00
Debt Service/ADM	29	1.00	76	1.00	42	1.00
Teacher-Pupil Ratio	1:2.7	----	1:8	----	1:11.4	----
Sq. Ft. Classroom Space Per Pupil	242	----	90	----	47	----

* - Expenditure functions of the lowest cost index district could not be computed; therefore, the second lowest cost index district was used for this program.

Programs for Multiple Handicapped Children

Educationally, we did not find this to be a useful category. We observed that the child's most educationally inhibiting handicap invariably dictates the primary instructional accomodations to be made.

The data that follow represent multiple handicapped children who for some reason have not yet been programmed into the regular program or into another special program. At lease two of the programs were quite similar to programs for the orthopedically impaired provided by other school districts.

TABLE 3.23 (RD 20)

PER PUPIL COST INDICES OF THE PROGRAM FOR THE MULTIPLE HANDICAPPED

District	A Exceptional Program Cost Per Pupil	B Regular Program Cost Per Pupil	C Differential (A - B)	D Cost Index (A/B)
M	$2,045	$ 690	$1,355	2.96
N	1,837	734	1,103	2.50
S	1,339	704	635	1.90
V	2,830	734	2,096	3.86
N=4	ΣX=8,048	ΣX=2,862	ΣX=5,189	ΣX=11.22
MEAN	$2,013	$ 716	$1,297	2.80
MEDIAN	$1,941	$ 734	$1,229	2.73

TABLE 3.24 (RD 21)

EXPENDITURE BY FUNCTION FOR SCHOOL DISTRICTS WITH HIGHEST, MEDIAN AND LOWEST PER PUPIL EXPENDITURE RATIOS FOR THE MULTIPLE HANDICAPPED

	School District					
	V (Highest)		M (Median)		N (Lowest)*	
Expenditure Category	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index	Cost/ Pupil	Cost Index
Management						
Administration	$ 42	1.00	$ 77	2.25	$ 40	1.00
Clerical & Secretarial	41	1.00	77	2.20	34	1.00
Instruction						
Teachers	1,305	3.32	647	2.02	738	2.30
Teacher Aides	---	----	267	64.30	250	250.00
Instructional Support						
Supplies & Equipment	54	1.00	36	1.00	55	2.89
Guidance & Counseling	9	1.00	11	1.00	8	1.00
Other	9	1.00	368	10.52	3	1.00
Institutional Operations						
Operation & Maintenance	668	8.90	99	1.00	378	7.00
Fringe Benefits	60	1.71	76	3.30	119	2.76
Other	52	1.00	56	1.00	168	1.00
Services						
Health	5	1.00	---	----	2	1.00
Food	1	1.00	47	2.13	30	1.00
Transportation						
Cost/Pupil in ADM	584	30.73	284	17.75	12	1.00
TOTAL–Current Operation	$2,830	3.86	$2,045	2.96	$1,837	2.50
Transportation						
Cost/Pupil Transported	$ 584	13.27	$ 365	2.57	$ 25	1.00
Capital Outlay/ADM	9	1.00	18	1.00	28	1.00
Debt Service/ADM	12	1.00	111	1.00	43	1.00
Teacher-Pupil Ratio	1:9	----	1:12	----	1:10	----
Sq. Ft. Classroom Space Per Pupil	267	----	30	----	210	----

* - Expenditure functions of the lowest cost index district could not be computed; therefore, the second lowest cost index district was used for this program.

Section B: Residential School Programs for Exceptional Children

It became obvious, after telephone conversations with private schools (none had responded to our correspondence), that detailed financial data would not be available from the private residential programs. It also became obvious that several state institutions would not or could not provide the required data. Therefore, we were able to obtain cost data on only seven state residential institutions, that is, considerably less than 50% of the residential programs contacted.

Programs for Severely Emotionally Disturbed Children

The target population is not unlike that described in connection with local school district programs - except perhaps in degree of severity. In tested intelligence, the target population approximates a normal distribution with some skewing toward the above average range. The average length of participation in the residential programs is less than two years.

Unlike the special programs described earlier, we cannot relate special program costs to regular program costs because the institutional program is a multidimensional "regular" program for the specified target population.

TABLE 3.25 (RD 22)

COST FACTORS OF RESIDENTIAL PROGRAMS FOR THE SEVERELY EMOTIONALLY DISTURBED

	Cost/Pupil
Management	
Administration	$ 452
Clerical & Secretarial	232
Instruction	
Teachers	2,232
Teacher Aides	202
Instructional Support	
Supplies & Equipment	452
Guidance & Counseling	331
Other	78
Institutional Operations	
Operation & Maintenance	618
Fringe Benefits	992
Other	149
Services	
Health	---
Food	---
Transportation	
Cost/Pupil in ADM	71
TOTAL–Current Operation	$5,809
Capital Outlay/ADM	
Debt Service/ADM	13
Teacher-Pupil Ratio	1:5

Programs for Neurologically Impaired Children

The purpose of residential care centers for neurologically impaired youth are to provide both educational and health services. The program goal is to teach self-care.

TABLE 3.26 (RD 23)

COST FACTORS OF RESIDENTIAL PROGRAMS FOR THE NEUROLOGICALLY IMPAIRED

	Cost/Pupil
Management	
Administration	$ 143
Clerical & Secretarial	197
Instruction	
Teachers	217 (1935)[a]
Teacher Aides	55
Instructional Support	
Supplies & Equipment	20
Guidance & Counseling	46
Other	221
Institutional Operations	
Operation & Maintenance	300
Fringe Benefits	219
Other	619
Services	
Health	303
Food	208
Transportation	
Cost/Pupil in ADM	3
TOTAL–Current Operation	$ 2,551 (4269)[a]
Capital Outlay/ADM	33
Debt Service/ADM	...
Teacher-Pupil Ratio	1:6

[a] If teacher salaries are distributed only over long-term enrollment, then the cost per pupil would amount to $1,935. Instead of $217. The latter is probably more realistic since short term enrollments receive mostly health and "other Instructional Services" such as those given by a psychologist and a therapist. Total cost would become $4,269. instead of $2,551.

Programs for Deaf and Severely Hard of Hearing Children

The purpose of these programs is to provide the specialized education needed by children who, because of their hearing impairments, are unable to benefit satisfactorily from the regular public school program. However, the curricular opportunities available do not vary significantly from those provided in most high quality public school district programs, the main emphasis being on communication skills.

TABLE 3.27 (RD 24)

COST FACTORS OF RESIDENTIAL PROGRAMS
FOR THE DEAF AND SEVERELY HARD OF HEARING

	Program		
	A Cost/Pupil	B Cost/Pupil	C Cost/Pupil
Management			
Administration	$ 226	$ 78	$ 310
Clerical & Secretarial	239	179	136
Instruction			
Teachers	1,528	923	1,129
Teacher Aides	---	6	78
Instructional Support			
Supplies & Equipment	62	95	46
Guidance & Counseling	---	849	15
Other	80	133	607
Institutional Operations			
Operation & Maintenance	1,277	864	721
Fringe Benefits	550	398	278
Other	935	91	211
Services			
Health	71	51	51
Food	483	498	351
Transportation			
Cost/Pupil in ADM	6	30	18
TOTAL—Current Operation	$5,457	$4,195	$3,951
Capital Outlay/ADM	$ 194	$ 33	$ 153
Debt Service/ADM	---	---	---
Teacher-Pupil Ratio	1:6	1:6	1:7

Programs for Blind Children

TABLE 3.29 (RD 25)

COST FACTORS OF RESIDENTIAL PROGRAMS FOR THE BLIND

	Program	
	A* Cost/Pupil	B Cost/Pupil
Management		
Administration	$ 288	$ 370
Clerical & Secretarial	212	130
Instruction		
Teachers	2,951	1,444
Teacher Aides	---	46
Instructional Support		
Supplies & Equipment	60	34
Guidance & Counseling	2,249	33
Other	128	708
Institutional Operations		
Operation & Maintenance	1,132	781
Fringe Benefits	721	290
Other	290	19
Services		
Health	556	60
Food	812	385
Transportation		
Cost/Pupil in ADM	111	39
TOTAL—Current Operation	$9,510	$4,339
Capital Outlay/ADM	$ 113	$ 60
Debt Service/ADM	---	---
Teacher-Pupil Ratio	1:4	1:5.4

* - Includes enrollments of blind (10%), deaf and blind (23%) and multiple handicapped (67%).

Ch.IV. Financing Programs for Exceptional Children: Retrospect and Prospect

Costs of Special Educational Programs

Figure 4.1 illustrates the low, median, and high cost indices which we identified for each of ten categories of educational programs for exceptional chidren.

We do not recommend that either fiscal or program planning be based on the lowest cost indices that we reported for each program. Based upon knowledge and insights gained from our interviews with personnel and from our observations in one or more classrooms in each program category in each of the school districts included in the sample, we do not believe that the lowest cost index programs provide appropriate models for program and fiscal planning over the next decade. We did not find them to be exemplary programs.

Turning to the highest cost index districts in each program category, it will be noted that the high cost indices ranged from a low of 1.28 in the intellectually gifted category to a high of 11.64 in the emotionally disturbed category. In a majority of the special programs, especially those which are relatively well-established, the range between the lowest and highest cost index district was not extreme — generally in the range of two or three to one. Closer examination of the extremely high cost index programs revealed that either the program was relatively new and still being developed, or that it served a small number of pupils with a consequent high cost per pupil, or that it emphasized very intensive work with pupils as reflected in a very low pupil-professional staff ratio. Thus, we believe that the high cost index programs also do not provide an appropriate base for fiscal planning, although some of them may represent programs which are indeed on the "cutting edge".

We believe that the median cost index programs afford the soundest basis for fiscal planning and forecasting. These programs tend to reflect what might be termed average practice in a set of school districts chosen because they were recognized as providing high quality programs for exceptional children. The median cost indices ranged from 1.14 in the program for intellectual gifted pupils to 3.64 in the program for physically handicapped pupils.

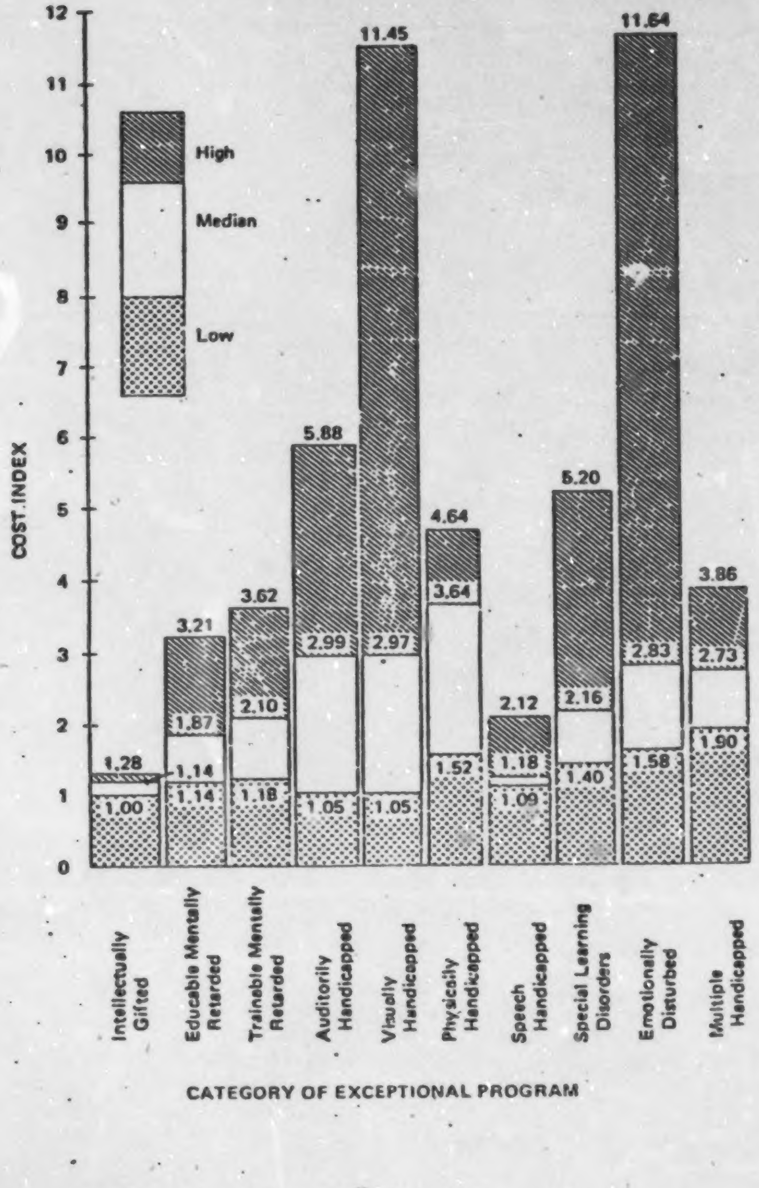
Costs by Function

Just as was the case in programs for regular pupils, the expenditure for the function of instruction (salaries of teachers and teacher aides) represented the largest single component of expenditure for special education programs for exceptional children. Our data also revealed that the cost of transporting some types of handicapped pupils tends to be very high. This is especially true in the case of crippled children, where specially equipped buses frequently must be provided. In those districts which reported a minimal expenditure per pupil for transportation, we noted that in nearly all cases the district did not make special transportation arrangements for handicapped pupils, leaving this as a parental responsibility.

Expenditure for the function of instructional support included the expendi-

FIGURE 4.1 (RD 26)

COST INDICES BY PROGRAM FOR SCHOOL DISTRICTS HAVING THE HIGHEST, MEDIAN, AND LOWEST COST INDEX FOR EACH CATEGORY OF EXCEPTIONAL PROGRAM



ture for guidance and counseling personnel and for other specialized personnel such as therapists, doctors, nurses, and the like. The expenditure for instructional support was an important component of expenditure in several programs where extensive use was made of such personnel.

The expenditure for institutional operation was directly related to class size. In most instances, the classrooms we observed being used for special education programs were regular classrooms which had been converted to such use. The lower pupil-teacher ratio which typically prevails in special education programs results in a larger square footage per pupil and thus increases the cost of operation and maintenance on a per pupil basis.

Consistency of Cost Indices

Bentley[1] utilized data obtained from the sixteen school districts included in the sample for which complete information on expenditures for various components of the regular educational program were available to examine the nature and consistency of the cost differentials which existed between educational programs for exceptional children and regular educational programs. With regard to the expenditure components which contributed to cost differentials in programs for exceptional children, Bentley found that only expenditures for clerical and secretarial services, and expenditures for food services did not contribute significantly to the cost differentials which existed between regular programs and special educational programs for exceptional children. All of the other expenditure components (administration, fringe benefits, instructional supplies and equipment, operation and maintenance, supportive services, teachers, teacher aides, and transportation) were found to contribute significantly to the cost differentials. However, the degree to which the various expenditure components contributed to the cost differentials varied considerably from district to district and from program to program.

Regarding the consistency and stability of the cost indices between regular and exceptional programs, Bentley found that only in the programs serving educable and trainable mentally retarded children were the cost indices consistent and stable between districts. With the exception of these two program categories, no consistent relationship was found between the level of spending by a district for its regular program and the level of spending by a district for the various categories of exceptional programs.

Bentley also found reason to suspect that a relationship exists between expenditure per pupil in special education programs and the type of support provided by the state for special education (i.e., categorical aid vs. general aid for special education). Districts located in states which provided general aid were spending at a lower level than those located in states which provided categorical aid. However, the small sample size and the selective nature of the sample precluded a definitive statement regarding the relationship between type of state support for special education programs and the expenditure per pupil in such programs.

identified in this study may be employed to determine the marginal cost of each special education program in a district in which the expenditure per pupil for the regular program is $655 (the median regular program cost in the districts in our sample). Column C (the product of Column A and Column B) represents the expected per pupil expenditure for each special program in a school district which is spending $655 per pupil in the regular program. (Admittedly, not many school districts spend exactly $655 per pupil in their regular program, but a known local figure could easily be inserted for computational purposes.) Column D, the difference between Column C and Column B, may be interpreted as representing the marginal per pupil cost of enrolling each additional pupil in a given program. For example, each additional pupil placed into a program for auditorily handicapped pupils can be expected to increase the fiscal burden of the school district in the amount of $1,303. If a new auditorily handicapped pupil were to move into the school district, then the additional cost would be $1,958. Thus, Column C may be interpreted as representing the marginal cost to the district of new pupils who require placement in the special program.

TABLE 4.1 (RD 27)

ANTICIPATED PER PUPIL EXPENDITURE AND MARGINAL COST PER PUPIL IN SPECIAL EDUCATIONAL PROGRAMS FOR EXCEPTIONAL CHILDREN BASED UPON THE MEDIAN REGULAR PROGRAM COST OF DISTRICTS IN THE SAMPLE

Category of Exceptionality	A Cost Index	B Median Regular Program Cost	C Special Program Expenditure (AxB)	D Marginal Cost of Special Program (C-B)
Gifted	1.14	$655	$ 747	$ 92
Educable Mentally Retarded	1.87	655	1225	570
Trainable Mentally Retarded	2.10	655	1376	721
Auditorily Handicapped	2.99	655	1958	1303
Visually Handicapped	2.97	655	1945	1290
Speech Handicapped	1.18	655	773	118
Physically Handicapped	3.64	655	2384	1729
Special Learning Disorders	2.16	655	1415	760
Emotionally Disturbed	2.83	655	1854	1199
Multiple Handicapped	2.73	655	1788	1133
Homebound/Hospital	1.42	655	930	275

The Cost of Educating Exceptional Children in 1980

To forecast the cost of educating exceptional children in 1980, one must have some knowledge of the prevalence of the various types of exceptionality. Unfortunately, the number of exceptional children in the United States has not accurately been established. There have been no comprehensive national studies to establish the prevalence of exceptional children on the basis of census information. The problem of determining the prevalence of children who may be classified under each of the various categories of exceptionaltiy is further complicated by the variations in the definition and criteria for identification of each exceptionality that exist among the states, by variations in the prevalence of various exceptionalities that occur from one area to another, and by incomplete data.

Prevalence Rates

In Table 4.2 are displayed various estimates of the prevalence of several types of exceptionality in the United States. The first widely used estimates were those by Mackie and Dunn which were published in 1954 and are still used as a basis of estimation in several states. Their estimates are shown in Column A of Table 4.2.

In Column D of Table 4.2, we report the range of estimates provided by eleven states in conjunction with a project dealing with state surveys and information analysis which is being conducted by Operations Research, Inc., for the Bureau of Education for the Handicapped, U.S. Office of Education.[2] (The other thirty-nine states were still using the Mackie and Dunn estimates as a basis for their forecasting.) Perhaps the most disappointing aspect of the data presented in Column D is the wide range of prevalence reported for most exceptionalities.

In columns E, F, and G of Table 4.2 we present estimates based on data obtained from recent studies in California and Wisconsin, and from the twenty-four districts sampled in this study. The data forms employed in this project not only provided for obtaining information concerning the number of children currently enrolled in the various programs, they also provided for obtaining estimates by school district personnel of the number of children in the district who were eligible for each program but who were not currently being served. The studies in California and Wisconsin also attempted to approximate as closely as possible the total number of exceptional children in each state.

The extent of agreement among these three sources regarding prevalence rates in the categories where no serious definition problem is involved is impressive. The variations in the prevalence rates reported for the educable mentally retarded, the trainable mentally retarded, the auditorily handicapped, and the visually handicapped categories are very small.

The prevalence rate of pupils served by programs for the speech handicapped in our sample districts is higher than the rate estimated from data provided by California and Wisconsin studies. However, it is likely that the programs provided by the districts in our sample involved more children with relatively minor speech handicaps than would the program in an average school district. The data obtained from the districts in our sample are considered to provide the

TABLE 4.2 (RD 28)

ESTIMATES OF THE PREVALENCE OF VARIOUS TYPES OF EXCEPTIONALITY IN THE UNITED STATES

Category of Exceptionality	Estimates of Prevalence (%)							
	A	B	C	D	E	F	G	H
Gifted	2.0	2.0	N.E.	N.E.	N.E.	N.E.	2.70	2.00
Educable Mentally Retarded	2.0	2.3	2.3	2.0-4.0	1.30	1.28	1.10	1.30
Trainable Mentally Retarded				0.2-0.3	0.187	.18	0.24	0.24
Auditorily Handicapped	1.5	0.075	0.575	0.5-2.0	0.10	.08	0.10	0.10
Visually Handicapped	0.2	0.093	0.1	0.05-0.25	0.05	.03	0.05	0.05
Speech Handicapped	2.0	3.5	3.5	3.5-7.8	1.98	2.40	3.60	3.60
Physically Handicapped	1.5	1.0	0.5	0.1-1.0	0.028	0.028	0.21	0.21
Neurological and Special Learning Disorders	N.E.	N.E.	1.0	0.3-2.0	0.50	0.026	1.12	1.12
Emotionally Disturbed	2.0	2.0	2.0	1.0-2.2		0.06	0.56	2.00
Multiple Handicapped	N.E.	N.E.	N.E.	N.E.	0.07	0.029	0.029	0.07
TOTAL	11.2	10.968	9.975	7.65-19.55	4.216	4.103	9.729	10.69

N.E. = No estimate

a. Estimates by Romaine P. Mackie and Lloyd M. Dunn, COLLEGE AND UNIVERSITY PROGRAMS FOR THE PREPARATION OF TEACHERS OF EXCEPTIONAL CHILDREN, USOE Bulletin No. 13, Washington, D.C., GPO, 1954.

b. Estimates by Romaine P. Mackie, Harold M. Williams and Patricia P. Hunter, STATISTICS OF SPECIAL EDUCATION FOR EXCEPTIONAL CHILDREN AND YOUTH, 1957-58, USOE Bulletin OE-35048-58, Washington, D.C., GPO, 1963.

c. Estimates prepared for Bureau of Education for the Handicapped, U.S. Office of Education, "Estimates of Current

(Cont'd)

TABLE 4.2 (continued)

ESTIMATES OF THE PREVALENCE OF VARIOUS TYPES OF EXCEPTIONALITY IN THE UNITED STATES

Manpower Needs in Education for the Handicapped, 1968-69," Washington, D.C., December, 1968, (Mimeo).

d. Estimates provided by eleven states to Operations Research in conjunction with "State Survey and Information Flow Analysis" Project for Bureau of Education for the Handicapped, U.S. Office of Education (Letter from Carl M. Koch, Principal Staff, Operations Research, Inc., 1970).

e. Estimates developed from information contained in "Statewide Summary of Annual Reports on Handicapped Minors Not Participating in Special Education Programs", California State Department of Education, 1968. (Mimeo).

f. Estimates developed from information contained in "1969-70 Summary of Special Education Services of Bureau for Special Education," Division for Handicapped Children, Wisconsin Department of Public Instruction, 1970. (Mimeo).

g. Estimates based on data regarding pupils enrolled and pupils eligible but not being served in the school districts which comprised the sample in this study.

h: Estimates used as a basis for population and cost projections in this study.

most accurate available information regarding the prevalence of speech handicaps, at least for the purpose of projecting the number of pupils who could benefit from such programs.

The data obtained from the Wisconsin and California studies and from our sample districts may best be interpreted as indicating the prevalence of physically handicapped children who require special educational programs, rather than the actual number of physically handicapped children in the population. Many physically handicapped children are totally integrated into the regular school program and require no special educational treatment. The data obtained from our sample districts and from the Wisconsin and California studies are considered to indicate quite accurately the prevalence of physically handicapped children who require special educational treatment.

Most authorities agree that the prevalence of gifted children in the general population is about 2 per cent. However, some school programs define giftedness in such a way as to enroll a higher percentage of pupils The percentage of pupils enrolled in programs for the gifted in the districts included in our sample was somewhat higher than the usual 2 per cent. The Wisconsin and California studies did not provide data concerning the prevalence of gifted pupils.

It will be recalled that, as a result of our difficulty in distinguishing between the educational treatment of two categories, we found it necessary to combine the category neurological disorders with the category special learning disorders in the analysis of the data in Chapter III. The data for these two categories are also confused by the fact that the special school programs are poorly developed and children with these problems have not even been identified in many school districts. We believe the true prevalence of these handicapping conditions is likely to be higher than the prevalence rates reported by our sample of school districts or the prevalence rates computed from data obtained from the California and Wisconsin studies.

Only a small number of the districts included in our sample reported data on programs for emotionally disturbed pupils. In general, programs for emotionally disturbed pupils are not well developed, and many school districts do not offer such programs. Consequently, we believe the earlier prevalence estimates of 2 per cent more nearly approximate the true prevalence of this exceptionality.

Data obtained from the California and Wisconsin studies and data obtained from our sample of school districts are in close agreement regarding the prevalence of multiple handicapped children. However, as we noted in Chapter III, educational programs for multiple handicapped children typically concentrate primary attention on that handicap which most seriously impedes the child's learning at a given point in time. For example, the educational program for the blind child who is mentally retarded generally will first concentrate primarily upon assisting the child to compensate for his blindness; and, when reasonable progress has been made in this area, the child will be placed in a program for mentally retarded pupils. Thus, we did not find the category of multiple handicapped to be widely represented in educational programming at the present time.

In Column H of Table 4.2 will be found the estimates of the prevalence rates of various categories of exceptionality which were used as the basis for forecasting the target population in each category. These estimates are based primarily on the data obtained from the districts included in our sample and on the data obtained from the California and Wisconsin studies. They are tempered by our best judgment concerning the true prevalence of the various exceptionalities based upon our review of previous research and upon our conversations with special education teachers, administrators, and other authorities in special education.

Some Factors which are likely to Affect Fiscal Planning and Educational Programming for Exceptional Children

Planning-Programming-Budgeting in Special Education

The lack of data with regard to the financial resources and the resource configurations which are being applied in programs for exceptional children and, indeed, in all other programs operated by school districts, is appalling. The data employed in this study were laboriously gathered from a variety of sources within each of the participating districts. Without exception, the districts in our sample, which by virtually any standard would be considered among the most progressive in each of the five states, did not maintain fiscal or personnel records which permitted them to identify easily the inputs to each program much less to relate program inputs to program outputs.

Much has been written in recent years concerning program budgeting and cost-benefit analysis in education. Cost-benefit analysis requires that quantifiable data be available concerning both the inputs to a program and the outputs from the program. With regard to programs for exceptional children, we found that data concerning inputs are exceedingly difficult to obtain and data regarding program output are virtually nonexistant. In this study, for example, we were forced to rely upon a sample selected on the basis of reputation rather than on the basis of empirical evidence of program effectiveness.

Until such time as school districts maintain fiscal, personnel, and pupil records on a program basis, it will be impossible to determine the relative efficacy of alternative arrangements for educating exceptional children, and to conduct meaningful cost-benefit analyses. In the absence of program related data, fiscal and program planning for educating exceptional children will be haphazard, if not chaotic.

An educational program in which there is little concern for the welfare of those who have completed the program is of doubtful merit. Unfortunately, we were disappointed to find very little being done in the way of program evaluation, or even in the follow-up of former pupils. And this was despite the fact that virtually all persons who are involved in educating exceptional children claim that one important objective of their program is to enable children to acquire the skills they need to function effectively as adults. Systematic comprehensive evaluation of educational programs for exceptional children is conspicuous by its absence. Conscientious evaluation of special educational programs for exceptional children, coupled with systematic feed-back of the results to those responsible for planning and programming, is an imperative need if such programs are to be improved.

Identification, Diagnosis, and Educational Treatment of Exceptional Children

Members of the project staff were impressed time and again with the importance of early identification of exceptional children, particularly those who are handicapped by conditions which are amenable to remediation or compensation. The earliest possible identification of such children is strongly urged. Although a massive screening program to identify such children very early in their life time undoubtedly will be expensive, the pay-off is likely to be high if the identification is followed immediately by an educational program designed to remedy or compensate for the child's handicapping condition. In many cases, early diagnosis and treatment will enable a child to move immediately into the regular program when he starts kindergarten or first grade. However, delay in identifying the handicapping condition and failure to provide treatment in a timely fashion may result in the child requiring continuing special educational treatment through his school career, if not throughout his lifetime.

Another important factor which will affect future fiscal requirements for special education is the fact that not all children who are affected by a handicapping condition will necessarily require special educational treatment. As noted above, early diagnosis and proper treatment often will enable the child to participate in a regular school program with only occasional help from a resource teacher. If the goal of a special education program is to return the child to the regular educational program and the normative learning stream, then one measure of the program's effectiveness is the extent to which children who meet the criteria for participation in such a program are, in fact, participating in regular programs with normal children.

A distinction must be drawn between special educational programs where the primary concern is behavior modification and special educational programs where the primary concern is cognitive learning. Obviously, both objectives are present in any educational program. In the case of trainable mentally retarded children, however, behavior modification is likely to assume primary importance when the goal is to enable the child to care for his physical needs. In the case of crippled children of normal or above normal intelligence, on the other hand, cognitive learning is likely to be the primary program concern with behavior modification a secondary concern. In other programs, such as those for the emotionally disturbed, behavior modification may be necessary before any significant cognitive learning can occur. From the standpoint of fiscal planning, behavior modification programs are likely to be more expensive than cognitive learning programs, primarily because they are more labor-intensive. That is, highly skilled, specialized personnel working with very small groups of children may be required.

Organizational Arrangements

The sample of school systems employed in this study included both public school districts and intermediate educational agencies. In addition, data were obtained from a small number of residential programs for educating exceptional children. It is obvious that some local school districts will never have a target population large enough to enable them to mount effective, efficient educational programs for all categories of exceptional children -- at least at typical prevalence rates. In sparsely populated areas, even very large school districts will have difficulty providing educational programs for certain categories of handicapped children. In other cases, school districts may have a population large enough to provide quality programs for most types of exceptional children, but not for all categories of exceptionality.

These problems point to the need for alternative organizational arrangements to accommodate the educational needs of exceptional children in situations where local school districts cannot provide adequately for their needs. In some states local school districts have banded together in cooperative arrangements where one district provides a program for one category of exceptional children, a second district provides a program for another category, and so forth. In other states intermediate agencies, such as county units or boards of cooperative educational services, provide educational programs for exceptional children when local school districts are unable to do so in an efficient and effective manner. Even in states where school systems are organized on a county basis, however, a number of counties usually do not have a population base large enough to provide adequately for the educational needs of certain categories of exceptional children.

Organizational arrangements which will make it possible to provide all children reasonable access to educational programs of high quality are a necessity if equality of educational opportunity is ever to be attained. Clearly, in many states some local school districts are too small to provide adequately for the educational needs of exceptional children without incurring an exorbitant cost on a per pupil basis. In such cases the establishment of alternative organizational arrangements for the education of exceptional children is necessary.

Facilities for Special Educational Programs

We noted great variation in the facilities provided for housing special education programs in the districts which were included in the sample. In some instances we observed new facilities designed specifically for the educational program they housed, and, in the same district, we also observed programs which were housed in sub-standard classrooms or modified storage rooms. Much greater vitality and enthusiasm was noted among special education personnel in situations where their programs were housed in adequate facilities and they were provided with all of the equipment necessary to perform their task effectively.

We are not enthusiastic about the provision of entirely separate facilities for exceptional education programs, except perhaps in situations where no other alternative is feasible. We believe that exceptional children should be housed on the same site, and preferably in the same building, as children engaged in regular educational programs. Thus, we view with some concern the developing trend in some intermediate units and cooperative agencies to construct school buildings for exceptional children which are isolated from the school buildings which house the regular educational program.

The Resource Room Concept

One of the most promising ideas we encountered was that of the "resource room". The development of this concept may result in the provision in every school building of a space where pupils could be tested and their learning problems diagnosed; where specialists could prescribe appropriate educational activities to remedy the problems; and where specialized instructional equipment and materials could be made available. In this arrangement each child is dealt with individually, his specific learning problems are diagnosed, and a prescription of the recommended educational treatment is provided the child's regular teacher. This enables the teacher to work with each child who has learning difficulties, whether moderate or severe, by utilizing special learning equipment and materials and following a plan prescribed by a specialist in learning problems.

Teacher preparation programs typically do not provide adequate training in the identification and remediation of learning problems. Very few elementary teachers are able to identify specific learning difficulties, much less treat them properly. While it may be desirable for a regular classroom teacher to be more knowledgeable in this area, it appears more efficient to rely upon specialists who are trained in the diagnosis of the specific learning problems, and in the methods recommended for dealing with such problems. While knowledge in this area is still sketchy, it is possible that the development of a diagnosis-prescription-treatment orientation in dealing with exceptional children would eliminate much of the need for special classrooms in which exceptional children are dealt with in isolation from normal children.

Teacher Supply and Demand

As noted earlier, special educational programs for exceptional children are very labor-intensive. They are characterized by low pupil-teacher ratios and a heavy input of specialized personnel per pupil. The labor cost associated with such programs inevitably is high.

The shortage of qualified teachers of exceptional children has led many school districts to offer an incentive in the form of additional compensation in an attempt to entice persons to this teaching field. Special training programs also have been developed to provide regular classroom teachers with the requisites for certification in the field of special education. It may be anticipated that, as the supply of teachers begins to exceed the demand for them, the current shortage of special education teachers will be alleviated. If this occurs, and if it is accompanied by a restructuring of compensation schedules in keeping with the new supply-demand situation, the personnel costs associated with special education programs can be expected to diminish.

Classification of Special Education Programs

As indicated in Chapter III, there is need for a taxonomy of special educational programs which is based upon educational treatment rather than upon medical and psychological criteria. In observing school programs for educating exceptional children, we noted little difference in the educational treatment provided pupils in several of the categories of exceptionality identified in our original taxonomy. For example, it was necessary to combine the category of neurological disabilities with the category of special learning disorders, both because of the similarity in educational treatments we observed and because of the overlapping criteria for placement in these categories. The term "educationally handicapped", which is used in California, appears to convey much more adequately the notion that the educational treatment which will meet the unique needs of the child may be much more important than the specific medical, psychological, or psychiatric criteria for placement in the program.

The Impact of Science on the Need for Special Educational Programs

Scientific and technological developments undoubtedly will affect future needs in special education. While the impact of unknown future developments cannot be forecast with precision, the impact of past scientific achievements is obvious. The development of Salk vaccine for the prevention of poliomyelitis has greatly reduced the incidence of crippled children; the discovery that retrolental fibroplasia was caused by a high oxygen content in the incubators of infants has reduced the incidence of blindness, at least from this particular cause; and the development of an effective vaccine for prevention of German measles is likely to affect significantly the incidence of handicapping conditions such as deafness, blindness, and crippling that have occurred in children born to women who sustained German measles during pregnancy.

On the other hand, some new drugs have had serious unforeseen adverse consequences. Thalidomide is a striking example. The effect of many stimulants, depressants, and hallucinogens on the prevalence of various handicapping conditions is yet to be determined. Also to be noted is the fact that modern medical technology enables us to sustain life in many infants who formally would have died because of their crippling or handicapping conditions. It is likely that many of the multiple handicapped children who are beginning to appear in school programs for exceptional children would not have survived infancy in past decades.

The increasing acceptance of birth control, and the development of simpler, more effective methods of birth control also may influence significantly the prevalence of exceptional children in the total population. However, the impact of these developments is very difficult to forecast at the present time.

Among the developments which appear on the horizon is the prospect of "genetic engineering" as a result of recent discoveries concerning the chemistry of inheritance. It may be possible at some future time to identify and replace defective genetic material, thus avoiding the occurrence of inherited crippling or handicapping conditions.

Knowledge which is accumulating concerning the chemical nature of learning also may affect educational programs for exceptional children. The potential development of drugs which will facilitate or inhibit learning and memory may lead eventually to synthesis of the chemical components of learning.

It is clear that any attempt to forecast future needs and the nature of future programs for educating exceptional children is subject to considerable error. New applications of existing knowledge, as well as the acquisition of new knowledge, may affect radically both the need for programs for exceptional children and the nature of the educational treatment provided fo such children. However, given the pace of change which has prevailed in schools in recent years, it seems likely that average educational practice in 1980 will resemble the best current practice of today.

COMMENT BY PRESENT AUTHOR

This excellent study has demonstrated the sophistication and scope necessary to clearly establish educational program costs. The authors were thoroughly scientific in presenting their methodology in sufficient detail to permit replication and evaluation. Data collection forms, interview schedule, costs and related program data for the school districts in the sample were appendixed. Supportive information on program content, delivery system, teacher-pupil ratios, and square feet of classroom space per pupil were presented. The introduction of the per pupil cost index as a useful measure of costs was an achievement in itself. Nevertheless, a number of criticisms need mentioning.

In the absence of measures of program quality (i.e., educational output), use of expert opinion in identifying quality programs of "best current practice" is inevitable though suspect. Similarly, teacher opinions of the appropriate pupil-teacher ratios have face validity only and may very well be biased in favor of the teacher, that is, fewer pupils per teacher. Note that the suggested pupil-teacher ratios were consistently lower than the existing ones.

The cost index as the ratio of special program cost over regular program cost was considered an improved measure because it controlled for regional variations in costs and accounting practices, and related special education to regular education. In fact, the indices of a particular program varied considerably across school districts indicating that too many uncontrolled factors were present. In particular, no distinction was made between elementary and secondary programs, between different delivery systems and different school district sizes.

The quantification of the results left much to be desired. The choice of the median instead of the mean cost index as the single best estimate of costs was justified by the occasionally extremely high index which inflated the mean and not the median. The same result could have been obtained by omitting these extreme results from the samples and would have retained the powerful analytic properties of the mean. As matters stand, only qualitative judgements are possible. The authors adopted the approach of comparing the cost profiles of the school districts with the highest, median, and lowest cost indices. However, it has been shown that patterns of costs related to the cost index were inconsistent across districts and programs (Bentley, 1970). Only cost indices of programs for EMR and TMR were found to be consistent in that level of funding of these programs was consistently related to the level of funding of the regular programs. A closer look at the data has indicated that the EMR and TMR programs were only relatively consistent and showed a considerable range of cost indices (Table RD 29). Therefore, comparing component expenditures of school districts with the highest, median and lowest cost index offers little advantage and may lead to erroneous conclusions.

The cost index undoubtedly helps in budget planning but is of limited use in funds disbursement. Perhaps if more was known of the factors affecting the cost index and these effects were quantified, the cost index could aid substantially in funds disbursement. Though diseconomies of scale were identified, no systematic study was made. Population statistics related to the school districts were available and may be found in Table RD 35.

Placing fringe benefits under institutional operational expenses is a questionable practice as benefits are normally associated with salaries. Also, lumping benefits of certified and uncertified staff obscures any attempt to analyse further the cost data. Mention was made of non-budgeted resources for exceptional programs obtained from benevolent societies and others, but no quantity estimation was made.

Despite the above criticisms and those mentioned by Bernstein et al (1976), this quality study is worthy of replication with some modifications.

The following tables were extracted from numerous tables as summary.

TABLE RD 29: Frequency Distributions of Cost Indices of Programs Educable Mentally Retarded, Trainable Mentally Retarded, Auditorily Handicapped and Physically Handicapped as Reported by Rossmiller, 1968-69

Interval of Cost Index	FREQUENCY			
	EMR	TMR	AUD. H	PHYS. H
1.0 - 1.49	6	4	4	-
1.5 - 1.99	8	7	1	3
2.0 - 2.49	5	2	1	1
2.5 - 2.99	2	6	3	1
3.0 - 3.49	1	2	2	2
3.5 - 3.99		1	2	4
4.0 - 4.49			-	2
4.5 - 4.99			3	2
5.0 - 5.49			-	
5.5 - 5.99			2	
TOTAL	22	22	18	15
MEDIAN COST INDEX	1.87	2.10	2.99	3.64

TABLE RD 30: Regular and Exceptional Program Costs and Cost Indices as Reported by Rossmiller, 1968-69.

Program Category	Exceptional Program Cost[a]	Regular Program Cost[a]	Cost Index
Educable Mentally Retarded	$1,316	$655	1.87
Trainable Mentally Retarded	$1,627	$655	2.10
Auditority Handicapped	$2,103	$655	2.99
Visually Handicapped	$2,197	$655	2.97
Physically Handicapped	$2,113	$653	3.64
Speech Handicapped	$ 799	$653	1.18
Special Learning Disorders	$1,757	$673	2.16
Emotionally Disturbed	$1,683	$655	2.83
Multiple Handicapped	$1,941	$734	2.73[b]

[a] Median value among sample of school districts.

[b] Small sample size of N = 4

N.B. Cost per full-time equivalent pupil.

TABLE RD 31: Pupil-Teacher Ratios of Special Education Programs Reported by Rossmiller, 1968#69

EMR[b] (N = 21)[c]	TMR (N = 20)	AUD. H. (N = 16)	VIS.H (N = 16)	PHYS.H (N = 12)	SP.H (N = 18)	S L D (N = 19)	EM.D (N = 13)	REG. (N = 17)
10.7	7.6	4.3[aa]	1.8[aa]	5.5	14.6[a]	4	2.7	16.6[a]
11	9	4.5[a]	2.4	6	26.8	5	4	16.9[a]
11.6	9.4	5	5	8.6[aa]	34.7	5.3[a]	4	20
12[a]	10[aa]	6.4[aa]	8	9.5	36	6[aa]	6	21
12	10	6.6	8	10.4[aa]	56	7[aa]	7.3[a]	22
12	10	7.4[a]	8	10.5[aa]	58	7	8	22.1
12	10.2[a]	8	8.5[a]	11[aa]	60	7	8[aa]	23
12.4	11.1	8	9	12.6	62	8	8	23.4[a]
12.6	11.5[a]	8	9	13[a]	65	8[aa]	8.5	23.6[a]
13[a]	12	9[a]	9	13.5[aa]	65.5[a]	10	10.6	23.6
13	12.7	9	9	19.5	79	10.3	11.4	24
13.3	13	9	9.5	20[aa]	79.8	11	12[a]	24[a]
13.7	13[aa]	11	10		88	11	16.5	24[a]
14	14	11	11		90[a]	11.5[a]		24.6[a]
14	14[a]	12	11.5[aa]		90.4	12.5		25.9
14.5	15.6	12.3	13.8		105	12.5		26
15[a]	16.4				131	12.7		26.7[a]
15[a]	17[a]				137	14		
15	17[aa]					16.4		
15.9	22							
15.9								

(Cont'd)

[a] Use of a teachers' aide.

[aa] Extensive use of a teachers' aide defined as $100. or more expended per pupil.

[b]

EMR:	Educable Mentally Retarded
TMR:	Trainable Mentally Retarded
AUD. H.:	Auditorily Handicapped
VIS. H.:	Visually Handicapped
PHYS.H.:	Physically Handicapped
SP.H.:	Speech Handicapped
SLD:	Special Learning Disorders
EM.D.:	Emotionally Disturbed
REG.:	Regular, i.e. non-special

[c] The number of school districts reported varies because some districts did not have a particular program operating, and some districts gave incomplete data.

N.B. This data was extracted from numerous appendices presented by Rossmiler et al (1970). The figures presented assume a denominator of one (1). For example, 11.1 should be read as 11.1 pupils per teacher.

TABLE RD 32: Statistics on Pupil-Teacher Ratios of Special Education Programs Reported by Rossmiller, 1968-69

	NO. OF SCHOOL DISTRICTS REPORTING	RANGE OF PUPIL-TEACHER RATIOS	MEAN PUPIL-TEACHER RATIO
Educable Mentally Retarded	21	10.7 - 15.9	13.3
Trainable Mentally Retarded	20	7.6 - 17.0	12.8
Auditorily Handicapped	16	4.3 - 12.3	8.2[a]
Visually Handicapped	16	1.8 - 13.8	8.3
Physically Handicapped	12	5.5 - 20.0	11.7[b]
Speech Handicapped	18	14.6 - 137.0	71.0
Special Learning Disorders	19	4.0 - 16.4	9.4[a]
Emotionally Disturbed	13	2.7 - 16.5	8.2
Regular	17	16.6 - 27.0	22.8

[a] Programs for the Auditorily Handicapped and Special Learning Disorders made extensive use of teachers' aides for low pupil-teacher ratios. It was concluded that two groups of pupils of differing intensity of handicap were being served in each of these programs.

[b] Extensive use of teachers' aides unrelated to size of pupil-teacher ratio.

N.B. These statistics were based on Table RD 30.

TABLE RD 33: Transportation Cost Indices of Special Education Programs as Reported by Rossmiller, 1968-69

HANDICAPPED CONDITION	AVERAGE COST INDEX
Educable Mentally Retarded	6.1
Trainable Mentally Retarded	11.7
Auditorily Handicapped	15.2
Visually Handicapped	18.5
Physically Handicapped	20.0
Speech Handicapped	1.0
Special Learning Disorders	11.4[a]
Emotionally Disturbed	5.5

[a] Based on data from 3 school districts.

N.B. These cost indices were obtained through averaging the indices of 4 to 6 school districts which gave evidence of discriminating transportation costs across handicapped conditions. The cost indices above should be treated as rough approximations.

TABLE RD 34: Total Per Pupil Current Operational Costs and Cost Indices of Residential Programs as Reported by Rossmiller, 1968-69

PROGRAM CATEGORY	PER PUPIL COST[a]	COST INDEX[b]	ROSSMILLER COST INDEX
Severely Emotionally Disturbed	\$ 5,809	8.87	2.83
Neurologically Impaired	\$ 4,269	6.51	2.16[c]
Deaf and Severely Hard of Hearing	\$ 3,951	6.03	2.99
Blind	\$ 4,339[d]	6.62	2.97

[a] Little or no transportation cost involved

[b] Using \$655 as regular education cost

[c] The Neurologically Impaired were grouped with the Minimally Brain injured (Texas) and Educationally Handicapped (California) under the rubric Special Learning Disorders.

[d] Mostly multiple handicapped including blindness

N.B. Rossmiller warns against comparing the residential programs to the public school programs as they deal with different pupil populations and the residential program has no regular program against which to compare. Keeping this warning in mind, the cost indices of the residential programs were all twice as large as the indices of the public school programs.

TABLE RD 35: Number of Pupils (Average Daily Membership) and Population of School Districts in Rossmiller's Sample, 1968-69

SCHOOL DISTRICT	(A) PUPIL ADM	(B) ESTIMATED POPULATION	PERCENT of A/B	
El Rancho, Calif.	14,421	52,900	27%	26%
Mt. Diabolo, Calif.	48,336	200,000	24%	
Alachua, Fla.	20,371	95,000	21%	22%
Dade, Fla.	232,126	1,139,500	20%	
Duval, Fla.	122,366	515,100	24%	
Lee, Fla.	18,098	83,200	22%	
Binghampton, N.Y.	11,906	67,000	18%	16%
Rochester, N.Y.	44,422	295,000	15%	
Schenectady, N.Y.	11,570	80,000	14%	
El Paso, Texas	60,779	275,000	22%	23%
Galenda Park, Texas	11,469	40,600	28%	
Lubbock, Texas	37,608	167,100	23%	
Plano, Texas	4,405	20,000	22%	
San Antonio, Texas	25,100	113,400	22%	
Appleton, Wis.	13,814	60,000	23%	18%
Green Bay, Wis.	19,833	109,000	18%	
Milwaukee, Wis.	123,602	750,000	16%	
Oshkush, Wis.	10,508	50,000	21%	
West Bend, Wis.	4,449	33,500	13%	
Range	4,405 - 232,126	20,000 - 1,139,500	13% - 28% (Mean = 21%)	

N.B.1. A few school districts have been omitted due to incomplete data.

N.B.2. Extracted from Table 2.2. of Rossmiller et al (1970)

APPENDIX SA

AUTHOR:	Schrag, Judy A.
TITLE:	A study of exceptional children in Idaho: Special education needs assessment study; Special education finance.
PUBLISHER/JOURNAL:	Department of Education, Idaho State; Office of the Superintendent of Public Instruction
DATE:	1974
NO. OF PAGES:	24

SUMMARY

This report was composed of eight (8) chapters with appendices: I. Overview, II. Prevalence of Exceptional Children in Idaho, III. Special Education Services, IV. Special Education Manpower, V. Consumer Satisfaction, VI. Special Education Fiannce, VII. Special Education Legislation, and VIII. Summary and REcommendations. Only the chapter on special education finance (VI) was available for review.

Operational cost data on 1972-73 were collected and analysed so as to permit cost comparisons between special education generally and regular education, types of exceptionality, different special education classroom models, grade levels of special education students, and finally, between large, medium, and small school districts. Cost information was collected on a student by student basis in the categories of: Administration, Instructional Personnel, Ancillary Personnel, Instructional Materials, Instructional Equipment and Instructional Space. This approach accounted for 90%-95% of total educational costs. Transportation, clerical/secretarial and food service costs were not included.

Nineteen school districts were randomly selected from three size strata: 5 small, 5 medium, and 9 large. Due to failure to complete data collection, two school districts were dropped, leaving seventeen (17) districts as the final sample. Within each district, exceptional children and a matched group of regular students were studied, with matching according to age, sex and member of typical classroom.

Unit costs per student were calculated, with the pupil hour as the most important unit of measurement. The following standard was utilised to calculate annual pupil hours: 1 school year = 100 days times 6 hours per day or 1,800 hours per year.

The types of classroom models and kinds of exceptional children included in this study were as follows:

Type of Classroom Model	No. of Classrooms	Percent of Total
Self Contained	15	14%
Work Placement	5	5%
Resource Room	62	57%
Special Design or Other Facility	26	24%
Total	108	100%

Type of Exceptionality	No. of Students	Percent of Total
Learning Disability	508	60.1%
Educable Mentally Retarded	239	28.3%
Trainable Mentally Retarded	45	5.3%
Emotionally Disturbed	35	4.2%
Hearing Impaired	7	.8%
Visually Impaired	1	.1%
Severely Language/Speech Impaired	4	.5%
Other (Multiply Handicapped and Physically Handicapped)	4	.5%
Gifted	2	.2%
Total	845	100.0%

The results were summarized in Tables 27, 28, 29 and 30. Cost indices were calculated, using the cost of the regular elementary program as denominator for indices of special elementary programs, and the regular secondary program cost as the denominator for indices of special secondary programs (Table 31).

The per pupil cost of the different classroom models were commented upon during the presentation of Tables 27 to 30. In general, utilization of resource rooms were the least expensive, followed by self-contained classrooms, with the work placement model as the most expensive. Substantial cost variations were noted in all classroom models.

The number of children sampled with exceptionalities other than learning disabilities and educable mental retardation were relatively small. Therefore cost data specific to these areas of exceptionality (gifted, speech handicapped, visually handicapped, and aurally impaired) may not be generalizable to the state. It must also be noted, however, that few numbers of children within these exceptionalities are currently being served within Idaho public schools.

The above limitation also applies to the cost indices.

Table 27. Average Annual Costs Per Special Education Student be Type of Exceptionality Within Large,
(SA 1) Medium and Small Secondary Education Programs, 1972-73

Type of Exceptionality	N	Administration Costs	Instructional Personnel	Ancillary Personnel Costs	Instructional Materials	Instructional Equipment	Instructional Space	Total Annual Costs
LARGE SCHOOL DISTRICTS:								
Learning Disability	80	19.41	656.81	23.99	89.58	33.51	115.81	928.24
Educable MR	42	20.41	871.60	21.47	104.66	27.43	155.63	1,186.99
Emotionally Disturbed	7	17.79	913.97	14.23	50.41	16.43	154.71	1,155.34
Trainable MR	5	20.79	820.84	14.23	24.69	25.80	326.24	1,226.90
Other	1	3.48	688.34	14.23	28.23	23.00	402.62	1,159.90
All Types of Exceptionalities	135	18.80	712.88	22.27	89.38	30.37	140.13	981.44
Regular Education Students	135	24.88	385.53	-0-	91.18	28.36	83.66	613.61
MEDIUM SCHOOL DISTRICTS:								
Learning Disability	25	44.31	523.20	41.52	104.33	36.05	21.62	771.03
Emotionally Disturbed	3	44.31	579.87	68.58	104.33	36.05	21.62	854.76
Hearing Disability	1	44.31	489.69	26.43	104.33	36.05	21.62	722.43
All Types of Exceptionalities	29	44.31	527.91	43.80	104.33	36.05	21.62	778.02
Regular Education Students	29	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
SMALL SCHOOL DISTRICTS:								
Learning Disability	25	36.07	762.00	12.65	35.00	44.00	263.83	1,153.55
Educable MR	5	36.07	748.00	12.65	35.00	44.00	236.84	1,112.56
Emotionally Disturbed	2	36.07	343.00	12.65	35.00	44.00	265.49	736.21
Other	1	36.07	290.00	12.65	35.00	44.00	54.52	472.24
All Types of Exceptionalities	33	36.07	720.18	12.65	35.00	44.00	253.50	1,101.40
Regular Education Student	33	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

N.B. Total enrollment of the 19 school districts was 67,270 or 36.4% of the total state enrollment. Approximately 2,093 students were enrolled in special education programs or 3.11% of the total enrollment of 67,270. Only 17 school districts composed the final sample upon which this table is based.

Table 28. Average Annual Costs Per Special Education Student by Type of Exceptionality Within Large, (SA 2) Medium and Small Elementary Programs, 1972-73

Type of Exceptionality	N	Administration Costs	Instructional Personnel	Ancillary Personnel Costs	Instructional Materials	Instructional Equipment	Instructional Space	Total Annual Costs
LARGE SCHOOLS:								
Learning Disability	159	25.17	686.31	38.40	86.15	28.81	99.72	960.60
Educable MR	112	20.25	730.33	46.42	88.34	28.41	99.72	1,009.74
Trainable MR	27	16.77	818.15	60.94	190.65	33.51	104.44	1,215.41
Emotionally Disturbed	13	20.83	472.46	44.00	84.77	25.55	77.03	714.48
Hearing Disability	3	18.58	268.73	36.00	65.95	8.61	57.99	443.86
Visual Disability	1	18.58	359.05	-0-	71.66	8.61	54.50	512.40
Speech Disability	1	28.15	304.28	-0-	7.33	17.37	80.00	437.13
Gifted	1	28.15	304.28	-0-	7.33	17.37	80.00	437.13
Other	2	3.48	523.17	N.A.	28.20	22.42	86.70	663.97
All Types of Exceptionalities	319	22.35	695.83	42.72	94.61	28.56	98.45	977.98
Regular Education Students	319	24.09	325.80	1.12	104.80	28.22	65.26	549.29
MEDIUM SCHOOLS:								
Learning Disability	104	53.78	683.30	19.28	42.00	14.84	94.63	900.40
Educable MR	9	83.07	933.78	-0-	61.18	15.66	131.44	1,247.36
Emotionally Disturbed	1	83.07	893.00	-0-	67.04	17.72	197.28	1,258.11
Hearing Disability	3	83.07	519.33	-0-	62.01	15.95	105.71	1,134.08
All Types of Exceptionalities	117	57.03	153.51	19.28	44.20	14.95	98.62	936.14
Regular Education Students	117	28.21	346.48	-0-	53.89	8.00	87.97	524.55
SMALL SCHOOLS:								
Learning Disability	78	45.33	609.55	13.61	41.90	18.90	140.27	869.58
Educable MR	3	44.39	723.99	12.71	96.71	24.58	148.18	986.09
Trainable MR	1	106.88	1,541.16	12.83	7.71	50.21	368.28	2,087.07
Emotionally Disturbed	8	56.98	385.22	6.53	10.42	8.58	191.65	659.38
Gifted	1	35.76	846.20	16.91	69.00	9.00	78.25	1,055.12
All Types of Exceptionalities	91	46.89	606.43	12.98	40.86	18.41	146.87	870.35
Regular Education Students	91	56.98	315.50	-0-	20.84	42.00	43.20	478.52

Table 29. Average Annual Costs Per Special Education Student by Type of Exceptionality, 1972-73
(SA 3)

Type of Exceptionality	N	Administration Costs	Instructional Personnel	Ancillary Personnel Costs	Instructional Materials	Instructional Equipment	Instructional Space	Total Annual Costs
ALL SECONDARY SCHOOLS								
Learning Disability	130	27.40	651.34	25.18	81.92	36.02	126.16	941.34
Educable MR	47	22.08	858.45	20.53	97.25	29.19	164.27	1,179.07
Trainable MR	5	20.79	820.84	14.23	24.69	25.80	326.24	1,226.90
Emotionally Disturbed	12	27.47	735.28	27.55	61.32	25.93	139.90	1,010.34
Hearing Disability	1	44.31	489.69	26.43	104.35	36.05	21.62	722.43
Other	2	19.78	489.17	13.44	31.62	33.50	228.57	816.07
All Types of Exceptionalities	197	25.98	707.70	23.82	82.47	33.49	141.68	1,004.35
Regular Education Students	197	24.88	185.53	-0-	91.18	28.36	83.66	613.61
ALL ELEMENTARY SCHOOLS								
Learning Disability	341	38.51	667.83	26.90	62.56	22.28	107.44	921.42
Educable MR	124	25.39	744.94	45.54	86.57	27.39	103.19	1,026.41
Trainable MR	28	19.99	843.97	59.22	184.12	34.11	113.86	1,246.54
Emotionally Disturbed	22	36.80	459.87	29.73	56.93	19.02	124.18	719.15
Hearing Disability	6	50.83	394.03	108.00	63.98	12.28	81.50	788.97
Visually Disabled	1	18.58	359.05	-0-	71.66	8.61	54.50	512.40
Speech Disability	1	28.15	304.28	-0-	7.33	17.37	80.00	437.13
Gifted	2	31.96	575.20	16.91	38.17	13.19	79.13	746.13
Other	2	3.48	523.17	N.A.	28.20	22.42	86.70	663.97
All Types of Exceptionalities	527	34.29	681.36	33.93	74.14	23.79	106.85	949.96
Regular Education Students	527	36.43	329.26	.37	59.84	26.07	65.48	517.45

Table 30. Average Annual Costs Per Special Education Students by Type of Exceptionality Within Large Districts, Other Facilities Sample Units,[a] 1972-73
(SA 4)

Type of Exceptionality	N	Administration Costs	Instructional Personnel	Ancillary Personnel Costs	Instructional Materials	Instructional Equipment	Instructional Space	Total
Learning Disability	37	18.58	737.87	10.49	72.66	19.00	190.71	1,049.31
Educable MR	68	19.74	1,162.83	17.67	84.73	29.77	188.25	1,503.01
Trainable MR	41	27.63	1,015.29	22.55	55.04	102.90	182.96	1,308.50
Emotionally Disturbed	20	44.49	786.46	49.53	14.44	32.00	76.68	2,323.28
Speech Impaired	3	29.39	1,411.82	60.61	42.99	65.57	93.24	1,703.61
Other	12	44.33	1,084.61	-0-	54.87	112.62	N.A.	N.A.

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[a] Includes special schools, child development center programs and day care facilities.

TABLE 31 (SA 5): Cost Indices Found in the Idaho Sample Study to Show the Differential Costs Between Regular and Special Education. (Not including transportation) , 1972-73

TYPE OF SPECIAL EDUCATION PROGRAM	N	COST INDEX
Elementary Programs:		
Type of Exceptionality		
Learning Disability	341	1.78
Educable MR	124	1.98
Trainable MR	28	2.41
Emotionally Disturbed	22	1.39
Hearing Impaired	6	1.52
Speech Impaired	1	.85
Visually Impaired	1	1.00
Gifted	2	1.44
Other	2	1.28
All Exceptionalities	527	1.79
Secondary Programs:		
Type of Exceptionality		
Learning Disability	130	1.53
Educable MR	47	1.92
Trainable MR	5	2.00
Emotionally Disturbed	12	1.65
Hearing Impaired	1	1.18
Other	2	1.33
All Exceptionalities	197	1.64
Other Facilities - Non Graded: [a]		
Type of Exceptionality		
Learning Disability	37	1.89
Educable MR	68	2.70
Trainable MR	12	2.35
Emotionally Disturbed	1	4.17
Speech Impaired	3	3.06
All Exceptionalities	121	2.44

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[a] These cost indices were based on a regular education cost of $555.19, which is approximately the mean of the regular elementary ($517.45) and secondary ($613.61) programs (Present Author).

N.B. Cost of regular program (1.0) has been subtracted from the above cost indices to yield cost differentials.

COMMENT

No evaluation of the overall cost accounting approach was possible as the necessary documentation was to be found in the absent appendices. Though a case can be made in favor of using pupil-hour as the cost unit instead of, for example, the per pupil Full-Time-Equivalent (FTE), the additional work required to estimate personnel work-loads and the inaccuracy of these estimates argues against this approach.

The attempt to compare costs of small,medium and large school districts indicated an awareness of the issue of "economy of scale". However, the criteria of district size was not fully explained in the available material. With a total enrollment of 67,270 for the original nineteen districts selected, we can safely presume that the large districts were rarely larger than 7,000, the medium districts rarely larger than 3,000, and the small districts less than 1,000 students (e.g. 7,000 x 9 + 3,000 x 5 + 1,000 x 5 = 83,000). That is, the range of district sizes according to total enrollments was very limited.

A study of Tables 27 and 28 indicated inconsistent trends when comparing across type of exceptionality. When summarizing across all types of exceptionalities at primary and secondary levels, no trend was evident when comparing small, medium and large districts (see Table SA6)

TABLE SA 6: Average Annual Costs Per Special Education Student at Primary and Secondary Levels within Large, Medium and Small School Districts, 1972-73.

	PRIMARY	SECONDARY
Large	977	$ 981.
Medium	936	778.
Small	870	1,101.

N.B. Figures extracted from Tables 27 and 28.

Several of the cost indices reported may be presumed to be deflated as transportation costs were not included.

APPENDIX TA

Taylor, G. The special costs of special education. Report on the 1973 Airlie House Conference sponsored by The Council for Exceptional Children, Warrenton, Virginia, February 28-March 1, 1973.

Taylor reports the results of a 1973 CEC conference that established a methodology and base to compute the excess costs of special education using data from Polk County, Iowa. The technique was designed to overcome a number of the objections to the NEFP approach raised specifically by Rossmiller and Moran (1973) before the National Conference on School Finance. One important objection is that empirical data can only represent the historical costs of traditional services, not the costs as they should be for appropriate services. As a result, two important factors distinguish the CEC approach: costs are analyzed by program delivery alternatives that consider severity as well as type of handicapping condition and expert opinion rather than pure empirical data is the source of cost determinations.

The CEC model assumes placement in an appropriate service delivery system for 100% of the handicapped population. A set of incidence rates is assumed (without source reference) and then applied against the total school population to arrive at an estimate of the total handicapped population. Based on the conferees' opinions, the students were placed in appropriate programs and the total costs computed. The excess cost is the increment over what would be incurred if all students were treated as regular students.

Comment

For considerations of equity mandated by recent court decisions, the CEC approach appears to be an important aid to the development of legislation and fiscal policy. Historical data are a function of appropriations dictated by the political process and not necessarily by any standards of need; the theoretical approach advocated in the article overcomes this drawback. Taylor, however, does not discuss the various problems, primarily political, which are inherent in using expert opinion as the source of normative decision making. The conferees' choice of a set of incidence rates—which Taylor does not explain—is another problem that is ignored, yet one that could alter the required funding level by millions of dollars.

(Above taken from Bernstein et. al. (1976))

APPENDIX TB

Thomas, M. A. Finance: Without which there is no special education. *Exceptional Children,* 1973, *39,* 475-480.

Thomas discusses the two primary problems of special education finance—adequacy and equity. She points out that the courts have begun to mandate minimum service levels that will require additional state funds and more effective allocation schemes. She describes how several reimbursement formulas are being used at present and how each tends to distort the delivery of programing and services in different ways.

Thomas identifies six models for allocating state funds to local districts. They are designated as: unit, weight, percentage, personnel, straight sum, and excess cost. The strengths and weaknesses of each are outlined. The areas influenced by the various funding schemes include:

1. Placement (low-cost versus high-cost programs, special classes versus mainstreaming).
2. Class size.
3. Labeling.
4. District variations (wealth, size).

The author formulates a series of questions that may be used to examine the adequacy and equity of different fiscal policies. The direction and magnitude of current reforms are discussed in a brief review of studies and current legislative proposals.

Comment

This short document is helpful in conceptualizing the nature and effects of particular funding schemes. It has been used frequently by other researchers in special education finance.

(Above taken from Bernstein et. al. (1976))